JUL 19 1917
UNIV. OF MICH.
LIBRARY

Vol. XXIV, No. 4 PSYCHOLOGICAL REVIEW PUBLICATIONS July, 1917

Psychological Review

EDITED BY

HOWARD C. WARREN, Princeton University
JOHN B. WATSON, Johns Hopkins University (*J. of Exp. Psychol.*)
JAMES R. ANGELL, University of Chicago (*Monographs*)
SHEPHERD I. FRANZ, Govt. Hosp. for Insane (*Bulletin*) and
MADISON BENTLEY, University of Illinois (*Index*)

ADVISORY EDITORS

R. P. ANGIER, Yale University; MARY W. CALKINS, Wellesley College; H. N. GARDINER, Smith College; JOSEPH JASTROW, University of Wisconsin; C. H. JUDD, University of Chicago; ADOLF MEYER, Johns Hopkins University; W. B. PILLSBURY, University of Michigan; C. E. SEASHORE, University of Iowa; G. M. STRATTON, University of California; MARGARET F. WASHBURN, Vassar College.

CONTENTS

Twenty-Fifth Anniversary of the American Psychological Association:

Varieties of Psychological Experience: Joseph Jastrow, 249.

The Need for Social Psychology: John Dewey, 266.

The Case of Self Against Soul: Mary Whiton Calkins, 278.

Relation between Structural and Behavior Psychology: A. P. Weiss, 301.

Discussion:

Meaning and Imagery: Thomas V. Moore, 318.

Some Experiments in Motor Reproduction of Visually Perceived Forms: George R. Wells, 322.

PUBLISHED BI-MONTHLY BY
PSYCHOLOGICAL REVIEW COMPANY
41 NORTH QUEEN ST., LANCASTER, PA.
AND PRINCETON, N. J.

Entered as second-class matter July 13, 1897, at the post-office at Lancaster, Pa., under Act of Congress of March 3, 1879

Psychological Review Publications

EDITED BY

HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)
JOHN B. WATSON, JOHNS HOPKINS UNIVERSITY (*J. of Exp. Psych.*)
JAMES R. ANGELL, UNIVERSITY OF CHICAGO (*Monographs*)
SHEPHERD I. FRANZ, GOVT. HOSP. FOR INSANE (*Bulletin*)
MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*Index*)

WITH THE CO-OPERATION OF
MANY DISTINGUISHED PSYCHOLOGISTS

PSYCHOLOGICAL REVIEW

containing original contributions only, appears bimonthly, January, March, May, July, September, and November, the six numbers comprising a volume of about 480 pages.

PSYCHOLOGICAL BULLETIN

containing critical reviews, notices of books and articles, psychological news and notes, university notices, and announcements, appears monthly, the annual volume comprising about 480 pages. Special issues of the BULLETIN consist of general reviews of recent work in some department of psychology.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY

containing original contributions of an experimental character, appears bimonthly, February, April, June, August, October, and December, the six numbers comprising a volume of about 480 pages.

PSYCHOLOGICAL INDEX

is a compendious bibliography of books, monographs, and articles upon psychological and cognate topics that have appeared during the year. The INDEX is issued annually in May, and may be subscribed for in connection with the periodicals above, or purchased separately.

ANNUAL SUBSCRIPTION RATES

Review and Bulletin: $6 (Foreign, $6.50). **Journal:** $3.25 (Foreign, $3.50).
Review and Journal: $6 (Foreign, $6.50). **Bulletin:** $3.25 (Foreign, $3.50).
Journal and Bulletin: $6 (Foreign, $6.50).
Review, Bulletin and Journal: $9 (Foreign, $9.75).
Index with any other two: $7 (Foreign, $7.50).
Review, Bulletin, Journal and Index: $10 (Foreign, $10.75).
Current Numbers: Review, 65c; **Bulletin,** 35c; **Journal,** 65c; **Index,** $1.25.

PSYCHOLOGICAL MONOGRAPHS

consist of longer researches or treatises or collections of laboratory studies which it is important to publish promptly and as units. The price of single numbers varies according to their size. The MONOGRAPHS appear at irregular intervals and are gathered into volumes of about 500 pages with a uniform subscription price of $4. (Postal Union $4.30.)

Philosophical Monographs: a series of treatises more philosophical in character.
Library of Genetic Science and Philosophy: a series of bound volumes.

Subscriptions, orders, and business communications may be sent direct to the

PSYCHOLOGICAL REVIEW COMPANY
Princeton, New Jersey

FOREIGN AGENTS: G. E. STECHERT & CO., London (2 Star Yard, Cary St., W. C.); Leipzig (Koenigstr., 37); Paris (16, rue de Condé)

VOL. XXIV. No. 4 July, 1917

THE PSYCHOLOGICAL REVIEW

VARIETIES OF PSYCHOLOGICAL EXPERIENCE[1]

BY JOSEPH JASTROW

University of Wisconsin

A commemorative occasion justifies a retrospective, though hardly a reminiscent mood. The personal justification lies in the fact that I speak as one of a small group—in this and all countries—who have held a monogamous professorship of psychology for a quarter century. The contrast of then and now stands forth partly as a shift in intellectual temperament, partly as a diverging succession of interests. Both are responsible for the historical moving-picture, which to our near vision still flickers by reason of imperfect fusion.

The dominant interest under which I began to profess psychology was clearly the experimental one; it set a novel and a positive programme. Equally assertive was the physiological plank. The two stamped one's alliance, in a sense made one a partisan. The emblem of the one was the laboratory, of the other an evolutionary faith and a sense of the reality of the body in the affairs of mind. They might have been emblazoned as a Hipp chronoscope rampant, and a copy of Darwin couchant. The bearer of this coat-of-arms was in many quarters under suspicion. He was more than a radical, less than a renegade. By implication he was challenging the accredited "mental science" of the colleges, which was a branch—in some cases a stunted twig—of philosophy, and a perquisite of the president. At educational gatherings—even more inconsequential and vaporous then than now—he was asked to defend the superiority of experi-

[1] Address given on the occasion of the celebration of the twenty-fifth anniversary of the American Psychological Association, New York, December 28, 1916.

mental over rational psychology; also to indicate what was the fate of the soul under the new regime. To the philosophers the psychologists seemed needlessly young and irresponsible; to the men of science they seemed out of focus or tangential. Now that the philosopher and the biologist have become our ready allies, the attitude toward us as militant invaders is almost forgotten, and may well remain so.

The credentials upon which psychology added a star to the united sciences were significant ones; it advanced from territorial governorship to statehood by patent of ancient right reëstablished under successful pioneering. It was not —as in the case of sociology—a squatter settlement in unoccupied land where the adjoining sciences failed to meet, but the declaration of independence of a domain quite too large and distinctive for colonial status. The first insistence was naturally upon technique. The novel sight, which to some was amusing, was not the philosopher descended to earth from his mythical habitat in the clouds, but actually donning overalls and using his hands. The garb seemed strange and lowly, even grimy. But rapidly enough the new psychology —like the new woman—became a more familiar and less forbidding *Erscheinung*, even revealing the eternally human traits. Problems followed the eclectic clue of technique. The early Wundt was compilational rather than systematic, though the Teutonic *Gründlichkeit* extended to architectural plan as well as building material. Wundt set the interests of the first group of American students of modern psychology, in which ancient and honorable body I may claim a place. The rallying point was the Johns Hopkins University—itself as new as psychology—under the leadership of the author of "Aspects of German Culture," G. Stanley Hall. He, however, found a small group of students already waiting; he quickly attracted others, and then (after five years) transferred his influence to Clark University. Stanley Hall's doctorate was the first given in psychology; Harvard University, 1878. My own was the second and the first given at Johns Hopkins specifically in psychology.

In so far as American psychology was a native product, it

reflected the pioneering spirit, the spirit of William James. No speaker on a commemorative occasion would forego the privilege of placing a wreath upon his monument. He was the first among us to bear the title professor of psychology; he holds that position not by priority but by preëminence. He stands as the exponent of the value of varieties of psychological experience. He made clear in his own person the intimate dependence of pursuit upon temperament. It was peculiarly fortunate for the recognition of the new psychology that its academic status was assured by the acknowledged leadership of so commanding an academician, so distinguished a scholar, so great a man. It was equally fortunate for the career of psychology in America that the stamp of the Jamesian genius pervaded its progress and directed its unfoldment to the desirability of seeing psychology steadily and seeing it whole.

The development of a new discipline in a new country encounters directly the social situation. Of first consequence was the accredited recognition by the universities and colleges; which meant the establishment of courses that could play a worthy part in the curriculum. In the conflict of classics and science, which in the days I am recalling was reaching its declining and conciliatory stage, psychology occupied an advantageous position, though it was exposed to the danger of falling down between two stools: the unrecognized stool of the laboratory, the exalted throne of philosophy. Yet the trend of opinion was pacifist and not militant. In the readjustment of the curriculum psychology may more frequently have been offered as a compromise than as a solution. But all this was helpful; the method of intelligence would have been better; but the method of trial and error was acceptable. Pragmatically the situation offered positions to those who would undertake the new training. In the words of the college song:

> "One day the summons came out of the West;
> 'Get Ph.D's and come,' rang the request."

I may readily indicate the status of teaching at that time by mentioning that when I responded there was no elementary

text available. Carpenter's 'Mental Physiology' both in title and content was about the only widely read book that reflected the new data and the new interpretation. The pioneer contribution was the invaluable work of Professor Ladd; and this celebrated its quarter century a few years ago by the appearance of the Ladd-Woodworth edition. The text implied a more generous course and a better type of preparation than the college curriculum afforded. To the teacher of psychology this monumental work was a daily support, and to the ablest students, often of nearly the same age as the teacher, a guide, philosopher and friend. The work of James appeared three years later. With the laboratory and seminar the lecture and research and the training course, and then the *American Journal of Psychology*, at Johns Hopkins; with the large personal influence and the systematic work at Yale, the decisive prominence of psychology in the graduate work in philosophy at Harvard, American psychology was launched. The auspices could not have been more favorable. The varieties of psychological experience represented by these creative personalities assured the development of psychology in this country a breadth of outlook, a soundness of technique, and a vital contact with the dominant intellectual interests, which have been most important assets. They may well stand central in our commemorative respect, a tribute to Hall, Ladd and James.

For a time the development of courses, the preparation of texts, the establishment of academic positions kept the small band of psychologists busy; also many of them could secure their positions only by a willingness to share the responsibility for allied teaching, mainly in philosophy, logic and ethics. Indeed these disciplines as commonly represented the major preparation, to which psychology was added. But the outward and visible sign of the psychologist was his laboratory; and the growth of these both for instruction and research represents the most distinctive American contribution. There is no parallel to it elsewhere. In a direct sense the laboratory is responsible for the largest increase in varieties of psychological experience. It set the experimental attitude

in inquiry, and this of all the several independent factors unmistakably shaped the career which we are passing in review. It has always been true in the history of science that the kind of questions men ask is determined by the facilities which they have acquired in answering them; though it is equally true that the sense of limitation of facilities has been the motive force in extending them to the inclusion of larger interests and newer problems.

I propose to touch only upon the larger varieties of psychological experience thus furthered. They may be summarized under five overlapping waves. The first is the direct exploration of the intimate structure of mental process, the direct analytical interest of the man of the laboratory. It immerses him in technique and device and the envisagement of problems; it immerses him unduly unless it carries with it the poise conferred by interpretation.

The second is the comparative interest, which in recent years has almost entirely reconstructed the view of animal behavior, and has yielded its interpretative product in the "behaviorist" position. Its high-power study of the beginnings of mind gives it the apect of psychological histology; but its far-reaching conclusions extend to the entire evolutionary programme of the mental life. It forces upon psychology the problem of the distinctive nature of the human endowment, and the stages of differentiation in the onward series.

One may place third and thus in the central position the growth, almost the overgrowth, of applied psychology. This reflects the practical stress of the environment and the pragmatic temper of the American *Weltanschauung*. It was born in the laboratory. The term 'mental test' is so distinctive of English, which in this case is American usage, that it has been adopted in German, French and Italian literature. It arose from the consideration that analysis is not only of the factors of a process but of their place in the individual psychology. The work of Galton should be recalled on this occasion for the reason that while the biological aspects of his versatile studies attracted most attention in England, the psychological sig-

nificance of his methods and results was more influential on this side. He emphasized the application of psychological tests in combination with anthropological traits. He established the first laboratory for such purpose; and it may be recorded that the first installation on this side was in connection with the World's Columbian exposition in Chicago, 1893, where also the visible embodiment of experimental psychology was shown to the public.

In applied psychology two aspects of psychological experience were involved: the first emphasized that the training of mind could proceed wisely only upon a knowledge of mind; and the teacher was referred, not without misgivings, to psychology. The second aspect was focused upon the ability of the tests to reveal individual capacity. Thus were laid the foundations of educational psychology which in the present outlook looms so momentously large that it heralds the dividing line of further specialization. It is making for a competitive share in professional status; the future division of function is indicated, though localization is somewhat uncertain. With the present expansion of departments one exponent is likely to assume responsibility for the analytical, theoretical disciplines, and another for their applications. Upon the warmly disputed question whether pedagogy is a science or an imposition, and its pursuit a profession or a misfortune, we may maintain an impeccably neutral position. We cannot overlook the fact that the psychology of the schooling processes, by sheer force of practical importance, is entitled to a commanding place in the training of teachers; while collaterally the investigations thus resulting give promise of rounding out the analyses of the learning processes to the great benefit of general problems of primary import. Here lie varieties of psychological experience of sterling value. To some the field has the appearance of extensions of city plots in unborn suburbs, neatly staked out in building-lots, with cement sidewalks but no habitations. The promoter in psychology is not unknown; but the new settlement seems less speculative to one who has a retrospective standard.

A distinctly settled section is that of tests of capacity, the

Binet-Simon addition. Applied individually the test invites a diagnostic use. The vocational pressure is intense; it should be encouraged and only its premature and cock-sure decisions resisted. It is characteristic that the sins of commission and omission alike are far more common among the practical cultivator of trees than among the more theoretical conservator of forests. Get-wise-quick methods offer the most lucrative rewards to the needy psychologist. At the moment we are besieged by requests to enlighten men of affairs how to choose employees, how to detect capacities, and by individuals how to increase mental efficiency. Only one who is blind to the lessons of history can fail to see the dangers in this great white way of psychology. One cannot look upon phrenology, physiognomy and the reading of character as merely the slums of psychology. Whatever the rating of the fakir, his customers come from all shades and grades of education. Here may be gathered interesting varieties of psychological experience; and a *candidatus philosophicus* in psychology may find a promising thesis by illuminating the psychology of fraud. Yet psychology will be shirking its social responsibilities if it declines to cross an unsavory threshold. It is not a sign of virtue to fear to tread, just because frauds rush in. Too proud to investigate is not a proper attitude. The problem of vocational and individual fitness is a wholly legitimate and, for the cautious and modest psychologist, an engaging pursuit. The reputation of the psychologist will depend upon the restraint with which he exercises authority, and pronounces judgments.

The practical varieties of psychological experience are worthy of respect in their own right. We all know that the road from theory to practice is the more indirect the more complex the situation. Qualities are far more generic than their applications. We must insist upon the legitimacy of the psychological perspective and decline to assume while yet we respect that of the practical inquirer with a narrower interest. A man will become a persuasive salesman, or a shrewd employer or a good teacher far more regularly upon the basis of a general equipment than of correspondence

courses. At all events it is in the interpretation of the underlying qualities of men that psychology, pragmatically disposed, finds its métier, however ready to utilize the trends of employment, and to direct inquiry to practically significant relations. The two perspectives must differ. The variety of experience is valuable; the forms of experience imposed by modern conditions acquire a peculiar importance; but none of these interests should distort the far more significant varieties of an historically larger and intrinsically deeper experience. In precisely the same sense in which the sociologist, fixing his attention upon modern conditions, will be handicapped by a narrow vision if he forgets that what he is studying with a specialized interest is in reality a transferred biological situation to be interpreted under the principles of biological relations, will the applied psychologist become a mere trained craftsman if his sense of design is unilluminated by the interpretative insight conferred by long immersion in the principles of psychology.

I have chosen deliberately to enlarge upon the practical varieties of psychological experience, for the reason that in this vista the retrospective view directs the enterprise which will plan the highways of the future. The attitude of American psychologists toward the possible and desirable applications of their pursuits, even the mode of capitalization of their personal value for public consumption, seems to me so peculiarly important that I have chosen to project an "insert" on a larger scale in the moving picture which I am unreeling. The psychologist, I repeat, must insist upon complete authority as an architect of his science; what consideration shall he give to the expressed needs and wishes of a possible clientele? The practical and the theoretical perspectives are distinct; how shall they be made to converge, and yet retain that singleness of vision which is indispensable to a solid, realistic, stereoscopic effect?

It requires no prophetic but only a presbyopic vision to foresee that the insistent demands of practice will form a league to enforce attention. The psychological practitioner is coming; upon us rests the responsibility that, when he comes

he shall be in no measure a quack or an opportunist, neither papal nor encyclopedic, nor pretend to be all things to all men. The training of psychologists cannot undertake the development of geniuses, who as a rule have found the academic environment unstimulating. A scientifically minded sense of proportion is the central equipment; with it must be combined a clinical sense for the recognition of varieties of experience when encountered. I resent the implication that because a large amount of money is spent in advertising, the psychology of advertising thereby gains in significance or importance. I welcome the fact that the actual interest in advertising supplies a variety of psychological experience which we may utilize to the full. Problems that loom large in application may have but slight illumination in principle, and be rather barren in enlightenment. The analysis of a practical occupation into its underlying factors is the legitimate work of the psychological practitioner; advice will gain in value as it strikes root in a soil enriched by scientific cultivation. The tendency which most I deplore is the neglect of the wider and the truer interpretation, because in some of its aspects it is less amenable to the rigid technique of the quantitative method. Falling in love with technique may be a pleasant but is hardly a rational indulgence. It forms one of the temptations, the idols of the practical mind. You see it pitiably at work in the pursuit of efficiency, with the result that there is more attention paid to cost-accounting than to the value of the article when produced. You see its menacing shadow thrown across the academic portals in the impertinent attempt to measure service by unit-hours and neglect quality and all the finer values incommensurate with the crude and irrelevant yardstick. If the method is continued, education will have but one purpose, ambitious and charitable at once: to make people efficient though incompetent. My plea is for the recognition, selection and cultivation of a psychological competency for practitioner and theorist alike; which is a plea, in an expert sense, for the varieties of psychological experience.

I have referred to the danger of mistaking a quantitative

result for an important one, of supposing that what is measurable is significant; likewise to the danger of supposing that what is practically demanded is by that right entitled to a large place in a scientific perspective. With these is combined the danger of proceeding to far-flung battle lines of conclusions upon a slender campaign of experimental results. None of these dangers operates simply; they combine subtly and intrude subconsciously, as is the manner of fallacy and her tribe. I can point the moral most quickly by using a tale for adornment, though I run the risk of stepping upon toes, the owners of which I respect. The extent of my hardihood will be clear when I say that I shall illustrate in terms of that vexed question of the mental differences of men and women. On the basis of well-designed experiments one observer concludes that women are less disposed than men to be affected by argument. In deciding whether one aggregation of markings contains more or fewer individual components than another, the women proved more tenacious of their original opinions (whether this is consistency or obstinacy is an unwise question) than did the men. Ergo women are less desirable than men as members of a jury. In citing this bit of evidence I am fortunate in that I agree with the significance of the findings; but I remain wholly unconvinced by the conclusion.

The second illustration finds me in the reverse attitude. On the basis of a painstaking and well-devised series of sensory and mental tests, the convergence of results measuring specific capacities proves to be far more striking than the divergences of men and women. Upon these data is based the conclusion that intellectual distinctions among the sexes do not exist; they are either the result of imposition of masculine dominance upon femine complacency, or the prejudiced views of tradition. The comprehensive evidence of the varieties of psychological experience embodied in the history of culture is cavalierly disregarded. Everything is ruled out of court except the findings of the laboratory in parallel columns of figures. The contributions to the subject are disposed of as belonging either to the literature of fact or the literature of opinion; which to my view is at once a specious and destruc-

tive distinction. Your quantitative fact, however exactly determined, must pass the judgment-seat of interpretation, personified in the venerable and wordly-wise figure of experience; then only will its contributive value appear. On the other hand opinion may be as valueless as gossip, and as important as any brand of truth accessible to the present generation. More particularly, the best of opinion is founded upon exactly the same appreciation of precise investigation, is imbued with precisely the same scientific method, reflects a parallel training and allegiance to accredited principles, as that which guides the experimental devotees. To disregard such contributions and to ignore historical experience on the strength of data authentic in their own province but only modestly significant outside of it, is to violate conspicuously the appreciation of varieties of psychological experience, which constitutes the most important equipment for the loyal psychologist.

Not to court misunderstanding, let me explain that I have properly selected instances of unquestioned authority, and also that the questionings which I have raised are directed with unbiased neutrality to point out the prejudice that is invited by generic interpretation, and by the neglect thereof. If we enlarge small findings to large conclusions we exceed our warrant. If the experimentalist insists upon the supreme value of his experience above all other varieties, proposes to disregard scientifically rigorous thinking expended in other problems than his, is convinced that the quantitative pattern is the only authentic one, that amenability to measurement is the indispensable passport for psychological citizenship, the future of psychology faces an undesirable and unnecessary impoverishment. Moreover it is just because the promising growth of the applied field favors so largely the sharply defined and technically interesting varieties of psychological experience, that the pure experimentalist should safeguard the comprehensive and broader aspects of his function.

With pardonable overemphasis I have cited the logical procedures leading to an agreement with Mme. de Stael: *les âmes n'ont pas des sexes.* According to this view minds have no sex;

according to Freud they have little else. And thus we reach a further variety of experience in the abnormal. The ascendency of the Freudian movement occupies the head-line in this section of the *revue;* whether by reputation or by notoriety critics cannot agree. Either view pointedly illustrates the complex significance of varieties of psychological experience and of the attitudes that lead to their favor or disfavor. Freudian psychology must be saved even more persistently from its friends than from its detractors. As I grasp its bearing, it forms an important and essentially true contribution made by the wrong men; its germinal ideas are sound despite the loosely woven evidence. To some the Freudian orchestra makes unseemly noise and nothing else; others hail it as the music of the future. Personally I am convinced that the acceptable Freudian sonata remains to be written; it will be composed by one imbued with the spirit of its method and possessed of a rare sense of the value of phrasing. The sex *motif* will be less insistent and strident, not silenced or ignored but sublimated. I have every sympathy with those who are nauseated by its seemingly cherished obscenity, and irritated by its seemingly malicious slander of the human mind. But my logical conscience rebukes me by a reminder that any such attitude is irrelevant. The Freudian principles and the Freudian mechanisms must be considered for their value as varieties of psychological experience, quite apart from the bad form and bad taste and bad logic of their support and supporters; the merit of the cause or the campaign and of the tactics or munitions must be judged separately. The Freudian reconstruction—for a time obscurely and disparagingly received, and only recently advancing to a conspicuous place—has vitalized a large realm of observation bearing upon the abnormal but equally valid for the normal experience. In every future retrospective view its place is secure. For the moment it may impress us as a capricious, disorderly *vers libre*, a libel upon the fair name of poetry or psychology; when the exotic and chaotic and neurotic elements have given way to fairer expression its contributions will be more fairly judged and seen.

My concern with the abnormal is limited to its extension of the varieties of experience, and their interpretation for normal use. This the Freudian doctrine attempts. In attempts it practically in the method of psychoanalysis, but confines the procedure to the disclosure of entanglements and disqualifications that impede and distress normal functioning. Yet psychoanalysis is a broader practical procedure, related to an applied psychology and the allied interest of diagnosis in all difficult situations. It embraces the experimental methods in its use of the association-material. It brings to the fore the province of the subconscious which constitutes one of the most significant enlargements of psychological experience, but one readily misinterpreted in favor of unassimilated hypothesis. The inclusion of the domain of the subconscious stands as one of the most significant annexations in the retrospect—a distinct settlement of territory wrested by a difficult exploration in an uncertain jungle.

Going back twenty-five years, one comes upon the thick of a fray that almost threatened a world-war in psychology. For the first five or ten years of my professional experience the popular view of a psychologist was a ghost-hunter. Psychical research held the field of popular favor; that a laboratory was anything else than a séance-chamber seemed incredible. The psychologist had to listen to inane stories of coincidences, that spoiled many a promising dinner-party. When he couldn't explain a lame and distorted tale, his inconsequence was made shamelessly and publicly evident. Scepticism was considered a mask for ignorance, and an unpleasant substitute for the lie direct. But the most remarkable aspect of the movement was the hold it gained upon men eminent in science—but not in psychology—through whose advocacy psychical research attained a prestige far beyond that accorded to psychology as we know it. Indeed in many quarters the interest in psychology was prompted by a hope that it would solve questions foremost in the minds of psychic researchers—such as telepathy and the survival of personality. That in some sense significant varieties of psychological experience pervaded that racially old field of belief, that persistent recurrence of

reversal of orderly mental sequence, was a position variously defended. All this has in these days the flavor of dried mementos. Yet it was only a half a dozen years ago, in these scientifically dedicated precincts, that a small group of us found it necessary to allay popular and learned unrest in regard to the specific mechanism by which a homemade basswood table defied the law of physics in the presence of a much heralded and sponsored Neapolitan and of a company sufficiently impressed to pay handsomely for each levitation of a skillful foot. The experience was at once humiliating and enlightening. Fraud-hunting as an indoor sport may have some zest if not value; or it may become a social obligation. It has helped to dissipate the surviving myth that the man of the academy is wholly lost in the mazes of a wicked world. Those of us who in the older days protested against the profanation of psychology, and were often snubbed for our insolence, may properly indulge in a moment of congratulation to the younger psychologists who have not this rôle to play. Yet the true interpretation of the phenomena that psychical research attempted to invite to unlawful secession remains a part of the gain of abnormal psychology.

The concluding phase of the composite psychological wave is represented by the psychology of social relations. Its pursuit obviously requires a capacity for broad interpretation, for the analysis of the deepest motives of human conduct, for the envisagement of underlying similarity of situation despite complexity of circumstance, for catching psychology on the hoof, and sensing its living products and pulsating throbs; my cental plea for catholicity of experience receives here its most direct justification. The laboratory with its simplified and scheduled analyses finds its corrective in the intricate worldly composite of conflicting forces. Social psychology represents the most elaborate phases of an applied science. It is applied in the tests of life. It quickens every interest that is entrusted to the psychologist, and justifies as it amplifies his problems. For it makes clear in how many directions psychology has a voice with other concerns, makes it clear that to be a psychologist implies a capacity to seize the

psychological value of experience which to other interests presents different aspects and appeals,—to single out the psychological instruments in the orchestration of life. All life is of one living; the psychologist, far less than the devotee of other specialties can afford to diagram or artificialize his *Fach*. He should be in the world and of it, in the best sense an interpreter of human values, capacities, enterprises; for his is the duty of directing and safeguarding the precious mechanisms upon which all living proceeds. Such must be his insight and his training that he may be rewarded by the respect of his fellows in science, his coöperators in practical affairs.

I look to the increasing study of social psychology for a redemption from too restricted specialization, for a balance to the dangers of absorption in technique, for a compensation for the limitations of the quantitative method. A sense of the reality, of the richness and fullness, the complexity and conflict, the growths, changes and transformations of the mind's products permeates this field as no other. In a measure it projects the culmination of psychological experience; it projects culture and the vaster problems of political and social striving as a psychological evolution, testifying to the greatness of the forces of mind. And we of to-day are witnessing the largest and most appalling issues of estrangement in ideals, sentiments, allegiances, that the world has faced; the psychology of war must be considered in the establishment of enduring human relations. The world is going to be wisely ruled, the endeavors of organized men more sanely directed, the errors of the past less disastrously repeated, if a body of men find participation in the direction of affairs possessed of a psychological discernment; for this insight is as indispensable to modern conditions in certain relations as is an economical, a political, or a business sense in others.

Lying close to this domain and making a parallel appeal is a body of knowledge, engaging in itself and vital in its applications, which I select for special consideration. I do so because it sets forth so amply and so pointedly the qualifications of the psychologist; also because it presents manifold relations to all the several divisions of the present review,

and thereby points the moral of my thesis. Dessoir in his "History of Psychology" recognizes it as one of the three great interests in the science of mind, with ancient antecedents and constant influence; he calls it psychognosis. In modern relations it may be viewed as an oblique or irregular section through the entirety of interests that form the composite of psychology; the specific disciplines consider the several fields more directly and disinterestedly. The nature of individual differences, the sources of these in human trends, their expression and emphasis in historical circumstance, their liabilities and possibilities in cultivation and decay, their contributions to human institutions—are all involved in psychognosis. The directions of temperament, the foundations of character, the total determinations of capacity and career form its subject matter. The temper of its pursuit is practical, but always with that wider and deeper foundation in varieties of human experience, which sends it back for analysis and authority to one and another discipline of psychology. It develops congenially under the type of interest that supports social psychology, has its strongest affiliations there; but it utilizes the entire range of psychological science and requires a catholic interpretation of the psychologist's function. Its restatement under the tremendous enrichment of the last twenty-five years of psychological investigation is an urgent desideratum of the present; and this obligation will do much to invite psychologists to that attitude toward their province which shall not be provincial but in the worthiest sense cosmopolitan.

The prospective and the prophetic venture is more engaging than the retrospective; commemorative occasions invite a Janus-faced, judicial attitude. The westward course of empire returning upon itself sets the gaze upon the east once more; with the rounding of the circle the conquests of the future turn to an inward advancement, to the perfection of the human equipment that comes from a comprehension of its nature, origin and history. In this vast reconstruction the psychologist comes to his own. He expresses and confers upon his disciples an interpretative sense, which in the be-

wilderment of change traces the orderly relations of law. Whatever the progress of the future, he recognizes in Kipling's words, that

> We can bring no more to living,
> Than the powers we bring to life.

THE NEED FOR SOCIAL PSYCHOLOGY[1]

BY JOHN DEWEY

Columbia University

On the surface it is just coincidence that the foundation of this association and the publication of the 'Principles of Psychology' of William James were so nearly contemporaneous, their respective dates being, as you know, 1891 and 1890. In view, however, of the depth and breadth of the influence of James, we who are celebrating to-day our twenty-fifth anniversary are at liberty, I think, to consider the coincidence as more than chronological, and to date back by one year the gestation of our association. At all events, it would be ungrateful to engage in any discussion of the past and future of social psychology without recalling the few rich pages of the 'Principles' which are devoted to the social self, and, in the discussion of instincts, to the native reactions of human beings in the presence of one another. Big books have been written since which are hardly more than an amplification of suggestions found in these few pages. When, for example, a few years later, the *Socius* became the hero of a psychological drama, not many recalled that he had already been introduced under that very name in the pages of James.

Again it is outwardly a mere coincidence that the work of Tarde on the 'Laws of Imitation' was published in the year in which the 'Principles' saw the light of day, and that practically all of Tarde's work fell within the decade lying between 1890 and 1900. But behind the pure coincidence there was the recognition of the need for social ends of a more scientific treatment of collective human nature, and the important rôle of psychology in building up the new social science. While James confined himself to pregnant suggestions concerning the new forms which human experience and

[1] Address given on the occasion of the celebration of the twenty-fifth anniversary of the American Psychological Association, New York, December 28, 1916.

selfhood take on because of the presence of other human selves, Tarde attempted an ambitious interpretation of almost all facts of social organization, progress and degeneration in terms of certain rubrics to which he gave a psychological quality. For more than a decade his work and that of his followers in France and in the United States—among whom we may cite in diverse directions Baldwin and Ross—dominated social psychology and almost sociology. I shall not rehearse the old discussions about Imitation as a psychological fact and a social force. I shall assume with most of contemporary psychological critics that as a descriptive and explanatory conception it misplaced emphasis and tended to distort facts. But nevertheless we cannot minimize the immense power of this stage of social science in popularizing the idea of social psychology, and in bringing into recognition many facts, such as the importance of prestige, fashion, sensitiveness to the beliefs of others, the difficulties which innovation, no matter how reasonable, has to meet, etc., facts which are permanently imbedded in social science. Tarde himself was certainly one of the most stimulating and varied of writers, and I do not think we shall ever outgrow some of his contributions, although to my mind they are found rather in logic than in psychology—such as the necessity for reducing the gross phenomena of social life into minuter events which may then be analyzed one by one. The most fruitful of his psychological conceptions was ahead of his time and went almost unnoted. It was that all psychological phenomena can be divided into the physiological and the social, and that when we have relegated elementary sensation and appetite to the former head, all that is left of our mental life, our beliefs, ideas and desires, falls within the scope of social psychology.

I hope I may find general agreement in pointing to the work of McDougall and Thorndike respectively as indicative of the next great force in social psychology, together with such writings as those, upon the social side, of Graham Wallas. Aside from valuable contributions in detail, the significance of these contributions lies, to my mind, in recalling social psychology from the wrong track in which the Imitation and

Suggestibility schools had set it going. For those schools gave the dawning science a wrong twist in carrying over into science the old popular and practical antithesis of the individual and the social, and thus setting up two independent and even contrary sciences—individual and social psychology. As a concrete illustration of the absurd results to which this antithesis led, it is perhaps sufficient to refer to those bizarre writings on the psychology of the crowd in which it was assumed that the psychology of the individual left to himself is reflective and rational, while man's emotional obsessions and irrationalities are to be accounted for by the psychology of association with others. From the root of all such aberrations we were recalled the very moment the problem was presented not as one of the relationship of a mythical psychology of an isolated individual mind to the even more mythical psychology of a mass or crowd or public mind, but as the problem of the relationship of original or native activities to acquired capacities and habits. Henceforth our social psychology is placed upon the sure ground of observation of instinctive behavior; it can develop upon the basis of fact undistorted by the requirement of meeting preconceived notions imported from without. The whole question of imitation, for example, reduces itself to one of fact: Is imitativeness one of the original tendencies of human nature. If so, what is its intensity and mode of working in conjunction with the other unlearned activities?

The popularizers of science will doubtless remain half a generation behind this as well as other scientific advances, but for those who have learned the lesson of recourse to fundamental responses, the way is opened for emancipation from the greatest foe with which social science has had to contend —which I shall take the liberty of calling the monistic. How often have we been invited to build up our social, political, and ethical explanations in terms of some single and supposedly dominant mental constituent! How often discussions and disputes have been, at bottom, only a question as to which of rival single claimants we shall yield allegiance. Instincts to power, to control of others, fear of authority, sex, love of

pleasure, of ease, all have been appealed to, and explanations constructed in terms of one or another exclusively. Henceforth it is, I submit, pure wilfulness if any one pretending to a scientific treatment starts from any other than a pluralistic basis: the complexity and specific variety of the factors of human nature, each operating in response to its own highly specific stimulus, and each subject to almost infinite shadings and modulations as it enters into combination and competition with others. The conception of social psychology resulting from this mode of approach becomes essentially one with that set forth by Professor W. I. Thomas in his paper on the province of social psychology at the St. Louis Congress of Arts and Science in 1904. On the one hand our problem is to know the modifications wrought in the native constitution of man by the fact that the elements of his endowment operate in this or that social medium; on the other hand, we want to know how control of the environment may be better secured by means of the operation of this or that native capacity. Under these general heads are summed up the infinity of special and difficult problems relating to education on the one hand and to constructive modification of our social institutions on the other. To form a mind out of certain native instincts by selecting an environment which evokes them and directs their course; to re-form social institutions by breaking up habits and giving peculiar intensity and scope to some impulse is the problem of social control in its two phases. To describe how such changes take place is the task of social psychology stated in generalized terms.

I hope I do not need to disclaim an attempt to give in even the barest summary the history of social psychology during the past twenty-five years. My object has been quite other. I have only wanted to refer to some salients in the intellectual fortifications constructed during this period for the sake of pointing out, in equally general terms, something of what now confronts us, waiting, nay demanding, to be done. Before passing on to this point, I feel I must avert possible misunderstanding by mentioning two allied factors which have also influenced the development of which I have spoken. One is

the application of statistical methods to psychological research; the other, the behavioristic movement. Neither was devised primarily in the interests of social psychology. The requirements of education have, however, been a powerful agency in promoting the former, while education presents, of course, one phase of the problem of social control. Speaking more broadly, social phenomena are of a kind which demand statistical mathematics rather than the type of mathematics which has been evolved especially for use in dealing with physical facts. Condorcet's great essay on 'The Progress of the Human Mind' forecasts a future in which human arrangements would be regulated by science. In dealing with the influence of mathematical science he points to the newly developing theory of probabilities as that branch of mathematics which is fraught with infinite potentiality for control of social progress. I think it is only fair to see in statistical psychology a step forward, short and halting though it be for the immediate present, in the realization of Condorcet's prophecy.

The behavioristic movement inevitably tends to confirm the tendency of which I have already spoken in connection with the writings of James, McDougall, and Thorndike. It transfers attention from vague generalities regarding social consciousness and social mind to the specific processes of interaction which take place among human beings, and to the details of group-behavior. It emphasizes the importance of knowledge of the primary activities of human nature, and of the modifications and reorganizations they undergo in association with the activities of others. It radically simplifies the whole problem by making it clear that social institutions and arrangements, including the whole apparatus of tradition and transmission, represent simply the acquired transformations of original human endowments.

This provides the possibility of a positive method for analyzing social phenomena. I shall avoid engaging in passing in the disputed question of the value of an introspective psychology. But it seems almost self-evident that even if introspection were a valid method in individual psychology,

so called, it could not be of use in the investigation of social facts, even though those facts be labelled social mind or consciousness. Yet one has only to look at the writings of the Austrian and German school of "folk-psychologists" (say of Wundt, obviously the most important) to see how this treatment has been affected by an assumed need of making the method and results of social psychology conform to the received categories of introspective psychology. From such deforming of facts the behavioristic outlook immediately redeems us; it represents not an improvement in detail but a different mode of attack. It is not as yet possible to estimate the significance of this alteration. In my opinion, however, the chief cause of the backwardness of social psychology has resided in the artificiality of the endeavor to adapt the rubrics of introspective psychology to the facts of objective associated life. The opening of another road of approach may therefore be expected to emancipate inquiry.

I thus come to the explicit statement of the purpose of my reminiscent sketch. The aim was to justify the presentation of the conviction that the quarter century in which this Association has existed marks just the emancipation of social psychology from influences which prevented its development on its own feet and its own merits, while the work done on lines which (as it seems to me) must be abandoned, have nevertheless done the great service of enforcing the vast field open to a social psychology, and the great need it has to serve. I turn accordingly from the past to the future, or if you will from prophecy taking the guise of history to prophecy frankly avowing itself as such.

I foresee, then, a great reflex wave from social psychology back into general psychology. An important conclusion in the psychology of native activities does not seem to have been drawn as yet by those who would base a scientific psychology upon this foundation. The conclusion seems inevitable that since 'mind' does not appear in the original list of instincts, it represents something acquired. It represents a reorganization of original activities through their operation in a given environment. It is a formation, not a datum; a pro-

duct, and a cause only after it has been produced. Now theoretically it is possible that the reorganization of native activities which constitute mind may occur through their exercise within a purely physical medium. Empirically, however, this is highly improbable. A consideration of the dependence in infancy of the organization of the native activities into intelligence upon the presence of others, upon sharing in joint activities and upon language, make it obvious that the sort of mind capable of development through the operation of native endowment in a non-social environment is of the moron order, and is practically, if not theoretically, negligible.

The net outcome of the newer type of psychological method is thus an unexpected confirmation of the insight of Tarde that what we call 'mind' means essentially the working of certain beliefs and desires; and that these in the concrete—in the only sense in which mind may be said to *exist*—are functions of associated behavior, varying with the structure and operation of social groups. Speaking in general terms, there is no more a problem of the origin of society than there is of the origin of chemical reactions; things are made that way. But a certain kind of associated or joint life when brought into being has an unexpected by-product—the formation of those peculiar acquired dispositions, sets, attitudes, which are termed mind. This by-product continually gains in relative importance. It increasingly becomes the significant acquisition among all the varied reorganizations of native tendencies. That anything which may properly be called mind or intelligence is not an original possession but is a consequence of the manifestation of instincts under the conditions supplied by associated life in the family, the school, the market place and the forum, is no remote inference from a speculative reconstruction of the mind of primitive man; it is a conclusion confirmed by the development of specific beliefs, ideas and purposes in the life of every infant now observable.

On the face of it, this conclusion has implications only for the theory of psychology. But slight scrutiny makes obvious its consequences for the struggle to gain control of the forces

forming society. The ultimate refuge of the standpatter in every field, education, religion, politics, industrial and domestic life, has been the notion of an alleged fixed structure of mind. As long as mind is conceived as an antecedent and ready-made thing, institutions and customs may be regarded as its offspring. By its own nature the ready-made mind works to produce them as they have existed and now exist. There is no use in kicking against necessity. The most powerful apologetics for any arrangement or institution is the conception that it is an inevitable result of fixed conditions of human nature. Consequently, in one disguise or another, directly or by extreme and elaborate indirection, we find the assumed constitution of an antecedently given mind appealed to in justification of the established order as to the family, the school, the government, industry, commerce and every other institution. Our increased knowledge of the past of man has, indeed, given this complacent assumption a certain shock, but it has not as yet seriously modified it. Evolution in the sense of a progressive unfolding of original potencies latent in a ready-made mind has been used to reconcile the conception of mind as an original datum with the historic facts of social change which can no longer be ignored. The effect on the effort at deliberate social control and construction remained the same. All man could do was to wait and watch the panorama of a ready-formed mind unroll. The French school of imitation, and its present successor, the Durkheim school of collective mind, has practically the same outcome as the German school of Volk-geist in this respect. All are engaged in explaining the past and present, and (if they predict at all) in predicting the future on the basis of the past. The new point of view treats social facts as the material of an experimental science, where the problem is that of modifying belief and desire—that is to say mind—by enacting specific changes in the social environment. Until this experimental attitude is established, the historical method, in spite of all the proof of past change which it adduces, will remain in effect a bulwark of conservatism. For, I repeat, it reduces the rôle of mind to that of beholding and recording the oper-

ations of man after they have happened. The historic method may give emotional inspiration or consolation in arousing the belief that a lot more changes are still to happen, but it does not show man how his mind is to take part in giving these changes one direction rather than another.

The advent of a type of psychology which builds frankly on the original activities of man and asks how these are altered, requalified and reorganized in consequence of their exercise in specifically different environments brings with itself the experimental attitude, and thereby substitutes the interest in control for the interest in merely recording and what is called 'explaining.' If mind, in any definitely concrete sense of that word, is an offspring of the life of association, intercourse, transmission, and accumulation rather than a ready-made antecedent cause of these things, then the attitude of polite aloofness or condescending justification as to social institutions has its nerve cut, and with this the intellectual resources of sanctified conservatism disappear. Instincts become mind when they are organized and directed with reference to the ends of attention, esteem, and endeavor which are supplied by the shared life of the place and time. The kind of mind they become depends upon the kind of objects of attention and affection which the specific social conditions supply. The task of unravelling the arrangements which exist into elements of native instinct and past acquisitions is indeed an infinitely complex and difficult one; not the less hard and extensive is the job of showing how this and that association with other persons develops this and that intellectual and emotional disposition—or mind—in this and that individual having his own peculiar original endowment. But if the history of human achievement in knowledge proves anything, it is that the all-decisive discovery is that of an effective and fruitful method. When men once hit, after endless awkwardness, upon the right road, the rest takes care of itself. Scientific movement becomes orderly and cumulative in the very process of occurring. Social and mental phenomena become intelligible because they come within the scope of the experimental method of attack. And again the

history of science testifies to a conclusion which may also be arrived at theoretically—the introduction of the experimental method is all one with interest in control—in modification of the future.

There is a genuine modesty, and there is a stupid simulation of modesty which is only a mask for lazy complacency. No science has so much cause to be humble about its actual achievements as has social science, including social psychology. But in prospect, in possibility, social science seems to me to stand about where physical science stood three centures ago in the early years of the seventeenth century. There is the same halting and obstructed tendency to move from the attitude of the outside spectator, classifier and justifier of things as they are outwardly given to that of the active participant and modifier, from that of wholesale organization to that of retail reorganization. The experimental method in physical matters brought with it a technique of control—a technique of invention and construction. Specific desired ends can be formulated in specifically analyzed terms; the conditions of their attainment stated; these conditions subdivided into known and unknown factors, and some definite estimate made as to the praticability, at the given time, of attacking the problem. That we are without any such technique in social matters is self-evident. That the attainment within reasonable time of a similar technique stands and falls with the possibility of developing a human psychology which shall be experimentally applicable to the understanding of social affairs is not, however, self-evident, and is my excuse for reiteration.

I venture accordingly to repeat a thought which I had the honor of presenting before this association some years ago. The need of social control is, of course, as old as associated life itself. But the need of that control at the present time is tremendously accentuated by the enormous lack of balance between existing methods of physical and social direction. The utilization of physical energies made possible by the advance of physics and chemistry has enormously complicated the industrial and political problem. The question of the

distribution of economic resources, of the relationships of rich and poor was never so acute nor so portentous as it is now; and this state of affairs is as much the result of progress in physical science as is the recognition of the Copernician astronomy. The present war is too vast and too tragic to permit one lightly to summon it as evidence for any merely theoretical thesis. But is it not, I ask, a demonstration made to order of those old words of Thomas Hobbes? "The utility of moral and civil philosophy is to be estimated, not so much by the commodities we have from knowing those sciences as from the calamities we receive from not knowing them." Such a conception is not fashionable just now; it is easier to place blame upon fate or upon the innate wickedness of human nature as seen in this or in that set of human beings. But the ultimate fate is the fatality of ignorance, and the ultimate wickedness is lack of faith in the possibilities of intelligence applied inventively and constructively.

Physical science has got to the point of bringing even the ends of the earth into physical, forceful relations with one another, and to the point of mobilizing all its resources for a contest in aggression and endurance. We are overwhelmed by the consequences of the very sciences into which have gone our best thought and energy for these last few hundred years. We apparently do not control them; they control us and wreak their vengeance upon us. Yet how infantile and pusillanimous are those who talk about the bankruptcy of science and who blame the increase of knowledge for our situation. Physical knowledge, and the consequent technique of control of physical forces, has far out-run social knowledge and its technique. The recourse of a courageous humanity is to press forward in the latter until we have a control of human nature comparable to our control of physical nature.

From the point of view of the psychology of behavior all psychology is either biological or social psychology. And if it still be true that man is not only an animal but a social animal, the two cannot be dissevered when we deal with man. Hence it is that subsequent years have enabled me to find added meaning in words which I spoke before this association

years ago, and which in conclusion I venture to repeat. "We are not called upon to be either boasters or sentimentalists regarding the possibilities of our science. . . . But we are entitled in our daily work to be sustained by the conviction that we are not working in indifference to or at cross purposes with the practical strivings of a common humanity. The psychologist in his most remote and technical occupation with mechanism may be contributing his bit to that ordered knowledge which alone enables mankind to secure a larger and to direct a more equal flow of the values of life."

THE CASE OF SELF AGAINST SOUL[1]

BY MARY WHITON CALKINS

Wellesley College

Most contemporary psychology tacitly ignores that concretely real being, the self or I. Psychologists experiment on mental processes of varying sorts, percepts, images, and emotions; they dispute about the attributes of sensation, the occurrence of imageless thought, the dimensions of affection. Rebels from the orthodox school have a new set of abstractions: psychophysical functions and modes of behavior which constitute, in their view, the proper object of psychological investigation. In the meantime, the self which perceives and feels and thinks, which functions and behaves, though so obviously cast by nature for the title rôle, plays no part at all on the stage of most psychological systems. More literally stated: instead of studying concrete wholes—namely, knowing, feeling, willing, functioning, and behaving selves, persons or *I*'s—the psychologist is wont to concern himself with one or another part or aspect of this concrete whole, often with a schematized, artificial construct, invented for purposes of easy description or in order to bring psychological method into artificial correspondence with that of the physical sciences.

The chief reason for this ominous neglect of the self in psychology is unquestionably the fact that I am always conscious of myself and that I am therefore inattentive to this "ubiquitous" self. "Just as, if I were asked to report fully my sensational experience at a given moment, I might well forget to name the sensations of pressure from my clothing simply because they are so constant"[2] so in my introspection

[1] A paper read November 24, 1916, before the Philosophical Union of the University of California. Part IV. has been enlarged and rewritten and the paper has been revised.

[2] Quoted from a paper by the writer, 'The Self in Scientific Psychology,' *Amer. J. of Psychol.*, 1915, **26**, p. 521.

I simply forget to name myself. A second explanation of this deplorable tendency to ignore the fundamental fact of psychology is found in the traditional confusion of 'self' with 'soul.' The chief business of this paper is to compare and to distinguish the two concepts.

It is necessary at the outset to agree, roughly at least, on the meaning of our terms. By 'self' I denote the object of the observation expressed in the words 'I am conscious of myself.' Obviously, this statement is no definition, and for the best of reasons: the self, or I, is, in truth, indefinable, since it is *sui generis*, in a class by itself. But though indefinable it is not, therefore, elemental and indescribable.[1] On the contrary, the self is a highly complex being which may be described by an enumeration of its characters. Among these characters of the self the following are surely fundamental: First, the self of each of us to some extent persists: I am in a true sense of the word the 'same' self who cut a philosophy class in her senior days at college in order to take a drive behind a pair of Vermont horses. In the second place, however, the self, with all its persistence, truly changes, develops: though an outgrowth from that frivolous self, and identical with her, I am yet a changed self. Third, and very significantly, I am a unique self: there is only one of me; I am an individual; no one, however, closely she resembles me, *is* I. The possibility of this enumeration shows, in the fourth place, that I am a complex self, a unity of present with past—yes, and with future—self and a totality, also, of many different experiences; I am a perceiving and remembering and thinking and feeling self. These different experiences or aspects of me do not, however, exist apart from me; I obviously am not what Hume called me, a bundle of perceptions, but each of the perceptions or emotions or thoughts is the expression of me who am inclusive of them. Finally, I am a self related to the world in which I seem to myself to be placed; my fundamental relation to the world I call my consciousness

[1] For the unjustified implication that the indefinable must therefore be elemental cf. E. B. Holt 'The Concept of Consciousness,' pp. 73–74: "Either consciousness is a complex entity not fundamental but definable in terms of simple entities that are not consciousness . . . or else consciousness is fundamental and simple."

of it, and within my consciousness I distinguish different forms of relation, as activity and passivity, and different complexes of relation, as perception, emotion, and the rest. All these characters, it must be added, are immediately experienced. The self, thus described, is observed and not merely inferred; is, therefore, a psychological datum which is taken over into philosophy when reflection discloses that it is the unique fact which can neither be denied nor even doubted without being at the same time asserted.

We have next to distinguish the concept of 'soul' from that of the immediately perceived, the persisting, changing, unique, complex and related 'self.' And here we find ourselves involved in great difficulties of interpretation. For, whereas the relatively late term 'self' is primarily psychological, the word 'soul' is common to many philosophies and to prephilosophic levels of civilization; so that the attempt to unravel its meaning is fraught with subtlest difficulties.

Among these varying meanings are three of commanding importance which for convenience we may designate as the biological (or vitalistic), the metaphysical (or immaterialistic), and the psychological conceptions of the soul. The first two are alike in that both define the soul with reference to the body, but they conceive the relation of soul to body in sharply opposed fashions. (1) According to the earlier, the vitalistic, view soul is equivalent to life. Every reader of early literature knows that the soul is often virtually identified, now with the blood, now with one or another of the vital organs, and again with the breath. This conception of the soul as breath differs, it must be noted, from the identification of soul with blood or heart or kidneys. For the breath though it gives life to the body leaves the body at death. In truth, the doctrine of the soul as *animus* or *spiritus* forms a sort of bridge, or transition, between the 'vitalistic' view and the immaterialistic conception of the soul. (2) This 'metaphysical,' or immaterialistic, doctrine regards the soul no longer as in positive relation to the body but rather as negatively related to it, contrasted with it, opposed to it. The early conception of the soul as shade, or ghost, is an approach to this meta-

physical doctrine, the Orphic, Platonic doctrine which persists to our own day, that the soul is an immaterial, simple, unchanging being. These characters, it will be noted, are the bare opposites of the materiality, the compositeness and the constant flux of the body so that the soul, thus metaphysically conceived, may well be defined as *not-body*. Along with this theoretical distinction of soul from body there goes a change in valuation. Whereas the Homeric shade is an insubstantial and a pitiable being, the immaterial soul of the philosopher is regarded as immeasurably more worthy than the body. (3) The third conception of the soul is as conscious being, as a something which perceives, feels and thinks. In truth, by this psychological conception soul and self are virtually identified. It is significant, therefore, to find that from earliest days men seem to have held this view of the soul along with one or both of the other conceptions. Thus, the Homeric ψυχή, primarily a vital phenomenon, has sense experiences, and the Homeric θυμός knows, feels and wills; the Platonic soul, though predominantly immaterial, unites sense experiences and apprehends ideas and loves wisdom; and Descartes's very 'metaphysical' soul has the principal 'attribute' of thought, that is, of consciousness. This fusion of concepts occurs, as will later be shown in detail, even when the characters of the soul, for example, changelessness and simplicity, are exact contraries of the observed characters of the self. Our immediate task is to compare and to distinguish these three conceptions as they appear and reappear in the history of thought. It will be necessary to make rigorous selection from a great mass of material; and we shall profitably begin by a study of the soul of Plato's 'Dialogues.'[1]

I

Plato's doctrine of the soul, like all the philosophical and scientific conceptions of the 'Dialogues,' is presented to us not in systematic form as an articulated body of doctrine but almost incidentally. One can hardly re-read the dialogues in

[1] This paper, in its first form one of a series of lectures on Plato, treats his doctrine at what may seem disproportionate length.

any unbiased way without noticing the relative rarity and usual fragmentariness of Plato's references to the soul. We are wont to stress these passages because later discussions have lent them such transcendent significance, but an unprejudiced study of the dialogues always leads us to reaffirm Paul Shorey's assertion that Plato is a dramatic artist and an impassioned moral and religious teacher, not a scientist or a metaphysician. Yet in spite of the incidental character of Plato's philosophical and psychological teaching, we may, I think, gain a fairly accurate notion of his conception of the soul; and we shall find that it contains all three of the factors, already noted, of the traditional soul-doctrine. That is to say: Plato somewhat confusedly combines the vitalistic, the immaterialistic, and the psychological conceptions of the soul. This summary account of his position has now to be justified.

1. The Homeric concept of soul as a bodily principle or activity was, of course, familiar to Plato. He obviously takes over this primitive view when he makes Socrates say, in the 'Cratylus': "I should imagine that those who first used the name ψυχή meant to express that the soul when in the body is the source of life, αἴτιον τοῦ ζῆν, and gives the power of breath and revival (ἀναψῦχον) and that when this reviving power fails then the body perishes and dies."[1] Here we have a conception of the soul as specifically the breath-giver, a notion which is strongly redolent of primitive thought.

Closely connected with this is the repeated teaching that the soul is mover of the body. This, again, is a theory adopted not invented by Plato. Thales, as we learn from Aristotle, endowed magnets with souls on the ground that the magnets occasion the movement of attracted particles; and doubtless the restless motion of fire fits it, in the view of Heracleitus, to define the soul. Thus, Plato is following an accepted tradition by his constant description of the soul as moving principle and—he adds—self-moved. "The soul," Plato says, in the 'Phædrus,' "is ever in motion. The body," he continues, "which is moved from without is soulless but that which is moved from within has a soul."[2] And

[1] 'Cratylus,' 399, *D–E*.

[2] 'Phaedrus,' 245, *E*.

this, it may be noted, is the teaching of the 'Phædrus,' a dialogue which can not well fall later than in the early-middle period of Plato's thought. But proof of the permanence of the conception is not lacking. For it reappears in Plato's latest dialogue, the Laws, in which the Athenian stranger speaks thus to Cleinias:

"Let us assume," he says, "that there is a motion able to move other things but not to move itself—that is one kind; and another kind is that which can move itself as well as other things. . . . And which . . . ought we to prefer as the mightiest?"

"I must say," Cleinias replies, "the motion which is able to move itself is ten thousand times superior to all the others."

"If then," the Athenian resumes, "as most of these philosophers have the audacity to affirm, all things were at rest, which of the . . . principles of motion would first spring up among them?"

"Clearly the self-moving," Cleinias says, "for there could be no change in them arising out of any external cause: the change must first take place in themselves."

"Let us put a question," the Athenian continues, "If we were to see this power existing in any earthy, watery or fiery substance . . . how should we describe it?"

"You mean to ask," Cleinias replies, "whether we should call such a self-moving power life. . . . Indeed, we should."

"And when we see soul in any thing," the Athenian insists, "must we not . . . admit that this is life? . . . The soul," he concludes, "is the first origin and moving power of all that is, or has become or will be."[1]

These last words of the Athenian stranger and their omitted context, as well as that of the passage quoted from the 'Phædrus,' indicate the content of Plato's cosmological theory that the stars and "the whole heavens and all creation" are moved by soul. But our discussion is limited to the study of the human soul and must utterly reject the lure of this reference to "all that is or has become or will be." On the

[1] 'Laws,' X., 894, *B*–895, *C*, 896, *A*.

other hand it must stress the emphatic and repeated identification of 'soul' with 'life' as proof that Plato—here as often the unacknowledged precursor of Aristotle—holds a genuinely vitalistic conception of the soul.

2. Clearly distinguished from the vitalistic concept of the soul as life, and often in the main inconsistent with it, is the doctrine cherished and stressed by Plato, which I am designating as the 'metaphysical' concept of the soul. This is the theory that the soul is utterly unlike the body, incorporeal or immaterial. The soul, Plato always asserts in opposition to the "vain opinion" of the "physical investigators," is not formed of fire and water and earth and air as its first elements; rather the soul is the "first," not last, "and before all bodies."[1]

It follows, Plato always assumes, that the inherently incorporeal soul is, as it were, a prisoner in the body or entombed within it.[2] Evidently, this is a perpetuation of the Pythagorean teaching that "for a punishment the soul is yoked with the body and buried in it as a tomb."[3] And Plato's assertions that the soul is separable from the body are similarly related to that Orphic belief which traces its source to the ecstatic Dionysiac rites in which "the possessed devotee was set free for the moment from the tangled net of daily life, gained for a brief time new and superhuman powers"[4] so that the soul seemed to be loosed from the body. Now the Orphic and Pythagorean doctrine of the soul's immaterial nature formed an inextricable part of the belief in the preëxistence of the soul. Both of these doctrines are enforced by Plato's teaching, but he supplements their early ethical and religious content by more narrowly metaphysical considerations. In the Orphic Fragments the doctrine of the preëxistence and the reincarnation of the soul enforces ethical exhortation by promising a period of reward or punishment in which "they who are righteous beneath the rays of the sun when they die

[1] 'Laws,' 891, *C*–892, *A*.

[2] 'Phaedrus,' 250.

[3] Quoted by Clement of Alexandria, Stromata, III., 17. (Diels, 'Fragmente der Vorsokratiker,' I., p. 245, Philolaos, *B*, 14.)

[4] C. H. Moore, 'Religious Thought of the Greeks,' p. 50.

have a gentler lot in a fair meadow by deep-flowing Acheron. . . . But they who have worked wrong and insolence beneath the rays of the sun are led down beneath Cocytus's watery plain into chill Tartarus."[1] The myths of Plato perpetuate this teaching and stress the individuality of the soul. Stripped of the body which is "interposed as a veil before" his own soul, the judge of the Gorgias "with his naked soul shall pierce the other naked souls" who have left their brave attire strewn upon the earth."[2] Those who have "already," in the words of the 'Phædrus,' "begun the heavenly pilgrimage may not go down again to the darkness."[3] But all the souls suffer for the wrong which they have severally done.

Plato's ethical soul-doctrine, it should be observed, consists not merely in an exhortation to the soul to escape the prison house of the body but in an emphasis of the domination of soul over body. "When the soul and body are united," he says, "then nature orders the soul to rule and govern and the body to serve." The soul is the pilot of the body; is at variance with the affections of the body; "coerces the bodily elements . . . as if talking to a thing which is not herself." But Plato, though he thus emphasizes the ethical aspects of the earlier soul doctrine, strengthens the conviction of the soul's freedom from the body's mortality by a philosophical (in a way a psychological) consideration. We are constantly, he points out, estimating people and things as good or beautiful or equal; and in our estimate we presuppose an absolute standard of goodness, beauty, equality and the like. Yet the objects we meet with in our actual human experience are never more than relatively good, beautiful or equal. It follows, Plato insists, that the soul must have existed without the body,[4] that "every soul of man has in the way of nature beheld true being: this was the condition of her passing into the form of man."[5]

[1] Fragment 154 *A*. (Quoted by C. H. Moore, *op. cit.*, p. 56, from Abel's edition of the Orphic fragments.)

[2] 'Gorgias,' 523, *D–E*.

[3] 'Phædrus,' 256, *D*.

[4] 'Phædo,' 73 ff.

[5] 'Phædrus,' 249, *E*–250, *A*.

So, the Platonic teaching about immortality preserves the ethical and religious coloring of the Orphic and the Pythagorean beliefs, on a background of philosophical conception and argument. Some of the arguments for immortality are, to be sure, drawn from that vitalistic theory of the soul with which, as will later appear, the immaterialistic concept is not actually to be harmonized. Thus, that latest argument of the 'Phædo' which Socrates brought forward like "a general rallying his defeated and broken army" is based on the admitted truth that "whatever the soul possesses, to that she comes, bearing life."[1] And in the 'Phædrus' immortality is argued from the self-motion of the soul: the self-moving soul, Socrates asserts, as true beginner of motion cannot itself be begotten.[2]

For the most part, however, the 'Phædo' argues immortality from the immateriality of the soul, its unlikeness to the body. Thus, when Cebes begs Socrates to argue them out of their fears, to persuade the "child within" them "not to be afraid when he is alone in the dark," Socrates answers thus:[3]

"The composite may be supposed to be naturally capable of being dissolved; but that which is uncompounded and that only must be . . . indissoluble. And the uncompounded may be assumed to be . . . unchanging, whereas the compounded is always changing. Now . . . equality, beauty—are these essences always what they are . . . not admitting of variation at all?"

"They must be always the same," Cebes answers. And Socrates continues:

"Let us suppose that there are two sorts of existences—one seen, the other unseen. The seen is the changing and the unseen is the unchanging. Further, one part of us [is] body and the other soul. And to which class may we say that the body is more alike and akin?"

"Clearly to the seen—no one can doubt that," Cebes replies; and Socrates asks:

[1] 'Phædo,' 105.

[2] 'Phædrus,' 245.

[3] Condensed from the 'Phædo,' 78–80, with the omission of most of the brief replies of Cebes.

"Is the soul seen or not seen?"

"Not by man, Socrates," Cebes answers.

"Then," Socrates says, "the soul when using the body as an instrument of perception is dragged by the body into the region of the changeable. . . . But when returning into herself she reflects, then she passes into the other world, the abode of purity, and eternity, and immortality, and unchangeableness. . . . And consider the matter in another light. When the soul and the body are united, then nature orders the soul to rule and govern and the body to obey and serve. Which of these two functions is akin to the divine? and which to the mortal?"

"The soul,' Cebes agrees, "resembles the divine and the body the mortal." And Socrates concludes:

"Then . . . the soul is in the very likeness of the divine, and immortal, and intellectual, and uniform, and indissoluable, and unchangeable; and the body is in the very likeness of the human, and mortal, and . . . multiform, and dissoluble, and changeable."

We are not at all concerned with the force of the argument nor with the difficult problem of the relation of soul to the essences or ideas. What we have to note are the characters of uncompoundedness and unchangingness here attributed by Plato to the soul—regarded, in metaphysical fashion, as immaterial being—predicates which are sharply opposed, or at least unrelated, to the characters of life and self-motion which are basal to Plato's vitalistic concept of the soul.

3. We have thus summarily outlined two Platonic conceptions of the soul, distinguishable if often uncontrasted: first, his conception of the soul as vital principle of the body, its breath, inciter to its movements, and second, what we have named his metaphysical conception of the soul as a changeless uncompounded individual being, radically different from body and variously thought of as dominating the body or as marred and hampered by communion with it. But Plato conceives, or at any rate treats, the soul in still a third fashion as a conscious being, as subject of experience. To begin with, the soul *recollects*. For Plato's well-known

doctrine of reminiscence is not merely a metaphysical speculation about reincarnation and an epistemological doctrine about absolute knowledge, but a psychological study of recognition and memory. In other words, the soul not only "calls to mind all she ever knew"[1] as the 'Meno' has it, but, in the words of the 'Philebus,' she has "the power . . . of recovering when by herself some feeling which she experienced when in company with the body"[2]—that is to say, the soul remembers sense-experiences. The soul also *conceives* and *compares* and *reflects*. "By a power of her own," Socrates is made to say, in the Theætetus,[3] "the soul contemplates the universals . . . comparing in herself things past and present with the future."[4] And Plato's conception of the conscious soul is not purely intellectualistic. The soul, he teaches, *feels pleasure and pain*, and "pleasure and desire" may "exist in the mind only apart from the body."[5] The soul finally *aspires*[6] and—as figured in all the myths of judgment—makes genuine choice. Moreover, the soul which perceives the physical and understands universals has also, Plato implies, a knowledge of itself. Thought is the conversation of the soul with herself; the knowledge of universals is a recollection of her former experience; her character is, as we have seen, the outcome of her own choice. The soul, finally, through her 'instruments,' the senses, *perceives*. In the words of the 'Philebus' there is in perception "union of soul and body in one feeling or motion";[7] and there are affections (*παθήματα*) which vibrate through both soul and body and impart a shock to both and each of them.[8] It is significant to find in this account of the perceiving soul a denial of the sharp opposition of soul to body.

The fundamental protest of this paper, it will be remembered, is against the confusion of the concepts of soul and

[1] 'Meno,' 81, *C.*
[2] 'Philebus,' 34, *B.*
[3] 'Theætetus,' 185, *E.*
[4] *Ibid.*, 186, *B.*
[5] 'Philebus,' 34, *C.*
[6] 'Theætetus,' 186, *A.*
[7] 'Philebus,' 34, *A.*
[8] *Ibid.*, 33, *D.*

self. If, however, philosophical convention is to be trusted, there is no room for the confusion in Plato's teaching since—so we are told—the concept of the self dawns late on the metaphysical horizon, and is descried at the earliest in the speculations of Plotinus. But whatever may be true of the term 'self,' however long the period before the self was formally introduced in metaphysical circles, philosophers, as well as other men, were conscious of themselves though—also like other men—they often forgot to mention the fact precisely because they were so accustomed to it. To return to Plato. Unquestionably, he uses the reflexive pronoun ἑαυτός-ἑαυτό to refer to impersonal as well as to personal realities; and certainly he does not explicitly refer to ego or self; but on the other hand he over and over again refers to the man (ἄνθρωπος) or to ourselves (ἡμεῖς) as being conscious. Thus, in 'Philebus,' 36, *A*, Socrates inquires whether one of us (τις ἡμῶν) who is hungry may not at one time have a sure hope of being fed and at another time feel in despair. "Each of us," he says in 'Republic,' III., "has many wants." Indeed, throughout the discussion of the virtues in the 'Republic,' the state is contrasted not with the soul but with the man (ἀνήρ) or with the individual (ἕκαστος); whereas the soul is referred to only incidentally and conventionally.[1] In these allusions to 'a man' and to 'us' it is at least possible to descry the germ of a psychological concept of the experienced self, no longer wholly overlaid by the conventional soul-concept. And if we are right in this interpretation we have here an early illustration of the greater empirical accuracy of statements about the self. Influenced by his dualistic prepossession to stress the contrast between soul and body, Plato, as we have already noted, scruples to say that 'the soul' perceives, whereas he clearly realizes—as everyone who, simply and without metaphysical bias, observes himself must realize—that 'we' perceive as surely as we think.

The estimate of self and soul doctrines is, however, best postponed to a point further on in our discussion.

[1] Cf. 'Republic,' 435, *C.* τὸν ἕνα . . . τὰ αὐτὰ εἴδη ἐν τῇ αὐτοῦ ψυχῇ ἔχοντα.

II

1. The conception of the soul most emphasized by Aristotle is, as everybody knows, the biological or vitalistic. The soul he says is the first entelechy, or realization, of an organic body—in a word it is the body's capacity for life. It follows, Aristotle teaches, that there are animal souls as well as human souls. And by this he does not mean to attribute consciousness to plants and animals but rather to attribute to them life. Like Plato and the earlier Greek thinkers, Aristotle also makes of soul "the source of local movement."[1]

2. Of the traditional immaterialistic conception of the soul Aristotle, on the other hand, shows hardly a trace. "We should no more ask," he observes,[2] "whether soul and body are one than ask whether the wax and the figure on it are one." Yet the conception of soul as life is an integral part of Aristotle's metaphysical system—the theory of the universe as ascending from primitive, unformed matter (pure potentiality) through successive stages (of which each is, viewed from below, realization, or form, and viewed from above itself potentiality) until at the end pure activity is attained: completely realized being, mind in contemplation of itself, mind which is principle of all motion in that it is goal of all desire and ultimate object of all yearning. The discussion of the Aristotelian philosophy, thus baldly suggested, would, of course, lead us far afield. What is important to our purpose is to notice that there is here no hint of the specifically immaterialistic conception of soul—no description of it as simple and uncompounded. And, so far from conceiving the soul as unchanging, Aristotle explicitly defines it as the progressive realization of growing capacities, or possibilities.

3. That Aristotle, beside conceiving the soul in the manner of the vitalists, certainly regards it after the psychologist's fashion, is shown by the slightest examination of the contents of 'De Anima.' In Book II., he distinguishes from the vegetable soul (ἡ θρεπτική) the animal soul which he here forthwith describes as perceptive (αἰσθητική). The remainder

[1] 'De Anima,' II., Chap. 4, 20, 415 *b*.
[2] *Ibid.*, Chap. 1, 7, 412 *b*.

of the treatise is given over to the discussion of the senses, sight, hearing, touch, and the others; of imagination (*φαντασία*);[1] of conception (*ὑπόληψις*); thought (*νοεῖν*); desire (*τὸ ὀρεκτικόν*).[2] All these are over and over again referred to in terms common to Aristotle's zoological and ethical as well as to his psychological writings as either parts (*μόρια*) or capacities (*δυνάμεις*) of the soul. Thus, the discussion of reason (*τό νοεῖν*) in Book III., Chapter IV., of the 'Psychology' is introduced by the words: "We must next investigate that part (*μόριον*) of the soul by which it knows and reflects (*φρονεῖν*)." These capacities or parts are differently enumerated in different passages; those most often named are the perceptive, the thinking (*λογιστικόν* or *νοητικόν* or *διανοητικόν*) and the impulsive or voluntary (*τὸ ὀρεκτικόν*, or *βουλευτικόν* or *ἐπιθυμητικόν*). More than once, indeed, Aristotle says that the soul is defined by thinking, judging, and perceiving, and that both by thought and by sense "the soul distinguishes and knows real things."[3] The simplicity and precision of the words just quoted ("the soul distinguishes," "the soul knows") bring into clear relief the artificiality of Aristotle's more frequent descriptions of conscious experience in terms, very often reproduced, of personified (yet to the end more or less fictitious) 'faculties'— imagination, reason, and the rest. More frequent than Aristotle's simple statements that the soul knows or thinks are his references to the man (*ἄνθρωπος*) who hears, smells or thinks; and still more frequent are his assertions that 'we' see and touch and perceive;[4] that images present themselves to 'us,' that 'we' judge (*κρίνομεν*), affirm or deny (*ἀληθεύομεν ἢ ψευδόμεθα*), feel fear.[5] Here, as in Plato's parallel expressions, we may perhaps fairly conclude that Aristotle is forgetting the supposed necessity to record his experience in terms of his philosophical doctrine and is conceiving a self, rather than a soul, which is conscious.

It should be noted that Aristotle's profound doctrine of

[1] 'De Anima,' III., Chap. 3, 7, 428*a*.
[2] *Ibid.*, III., Chap. 9, 3, 432*b*.
[3] *Ibid.*, III., Chap. 3, 1.
[4] *Ibid.*, III., Chap. 3, 6, 428*a*.
[5] *Ibid.*, 5, 427*b*.

substance, as elaborated in the 'Metaphysics,' plainly connects itself with the conception of the soul. To trace the connection would be to involve ourselves in a long discussion, but we can not avoid the conclusion that Aristotle, for whom the ultimately real was always neither matter nor form but the individual, meant to endow the soul with this character: uniqueness or individuality.

III

By Stoic, Judeo-Alexandrian, Neo-Platonic, Patristic, and Scholastic thinkers the triple conception of the soul has been handed down to modern psychologists and metaphysicians. The soul-doctrine of the pre-Christian schools belonged, as is well known, to a pantheistic philosophy. The soul was regarded by the Stoics as part of the Universal Reason, by the Neo-Platonists as emanation through the world-soul from the One. But all—Hellenic, Jewish, Alexandrian and Christian thinkers—united to emphasize the worthlessness of the body and the supremacy of the 'soul burdened with a corpse.'[1]

It is not necessary to consider in detail most of these theories but it would be impossible to pass over Augustine's teaching. The conception of soul and self are, as everyone knows, central in his philosophy; and he conceives the soul in each one of the three traditional ways. (1) Although he repudiates the essential materialism of the primitive vitalistic conception which identifies the soul with the blood he yet everywhere insists that the conscious soul is a living being. And from the attribute of life he argues, in Plato's fashion, the immortality of the soul. "Those," he says, "who have held [the soul's] substance to be some kind of life . . . have striven also to prove it immortal, since life can not be without life."[2]

(2) More often, however, Augustine sets forth the immaterialistic theory of the soul. His teaching is very close to that of Plato. The soul, he asserts, in words perpetuated for centuries, is a spiritual substance:[3] it is incorporeal—and

[1] Attributed to Marcus Aurelius (quoting Epictetus).

[2] 'De Trinitate,' X., 7.

[3] 'De Trinitate,' XI., 1; 'De Quantitate Animæ,' Chaps. II., III.

he argues this, as Plato has argued it, on the ground that the soul discerns incorporeal things (*cernit incorporea*),[1] such, for example, as mathematical quantities. The incorporeal nature of the soul, Augustine also teaches, implies its unextendedness—a negative character which he stresses very likely in opposition to Tertullian's materialistic view. Over and over again, in 'De Quantitate Animæ'[2] and in 'De Immortalitate,' Augustine repeats the statement that the soul feels throughout the body (*per totum corpus*) but not with the body (*cum corpore*). The reiterated statement that the soul is simple has the same meaning, that the soul acts as a whole (*tota operatur*). And from its unextendedness and its simplicity he deduces, after the traditional fashion, its unchangingness, imperishability and immortality. He argues in detail that though the soul seems to grow, to develop with the body, it is none the less unchanging. *Non mutatur*, he reiterates in passage after passage.[3] Finally, in his account of the relation between soul and body Augustine follows Plato with especial fidelity. The soul, he everywhere asserts and implies, is the ruler of the body (*rationis particeps regendo corpori*).

(3) Up to this point we have nothing radically new. The vitalistic doctrine of the soul is set forth less convincingly by Augustine than by Aristotle; the immaterialistic doctrine in no wise advances upon Plato's. But Augustine's treatment of the soul as subject of consciousness or knowledge is like new wine in new bottles—an outpouring of first-hand observations, a formulation of acute and independent reasonings. The pages in which he discusses loving and knowing, remembering and attending, thinking and willing, seem to me, though written so long before the rise of scientific psychology, comparable only with the introspective passages of William James for their luminousness, their revealing quality, their ability to cleave asunder the most tortuously intertwined human experiences.

The most emphasized and most truly novel contribution

[1] 'De Trinitate,' X., 7; 'De Quantitate Animæ,' Chaps. XIII., XV.

[2] Cf. Chaps. XXIII., XXX.

[3] 'De Immortalitate,' Chap. I. Cf. 'De Quantitate Animæ,' Chaps. II., XV., XVI.

of Augustine to this psychological conception of the soul is his insistence on the fact that the soul knows itself. We are not here concerned with the implications of this fact for philosophy —the significance of the discovery of this one reality, myself, which is self-evident because in doubting or denying it I assert it. What we are here remarking is the enlargement of the concept of knowing soul by the explicit recognition of its self-knowing character. "'Know thyself,'" Augustine asserts, "is not said to the mind as is 'Know the cherubim and the seraphim'; for they are absent, and we believe concerning them. . . . Nor yet as it is said 'Know the will of that man'; for this it is not within our reach to perceive at all, either by sense or understanding, unless by corporeal signs actually set forth; and this in such a way that we rather believe than understand. Nor again as it is said to a man, 'Behold thy own face'; which he can only do in a looking-glass. For even our own face itself is out of the reach of our own seeing it. . . . But when it is said to the mind, Know thyself: then it knows itself by that very stroke by which it understands the word 'thyself'; and this for no other reason than that it is present to itself."[1]

With equal subtlety Augustine discusses all forms of knowledge. At times, but only apparently by accident, or in theological exigency, he follows Aristotle in apotheosizing the abstractions 'memory,' 'thought' and 'will.' Usually, however, he says concretely that the mind remembers, thinks, judges, wills; or else he says even more concretely, *I* remember, *I* will. For the truth is that Augustine uses the *self*-words, 'I,' 'he,' 'self,' 'man,' nearly if not quite as often as he uses the terms 'soul' or 'mind,' and seemingly he employs the two sets of terms interchangeably. An example of this interchange is selected at random from Chapter XI. of Book X. of 'De Trinitate.' Augustine is arguing that though memory, understanding and will are three yet each is contained by each. He begins with the statement that "The mind is certain of these three things concerning itself . . . memory, understanding and will," but ends with the assertion: "What-

[1] 'De Trinitate,' X., 9.

ever I understand I know that I understand and I know that I will whatever I will and whatever I know I remember." Here the term 'I' replaces the term 'mind' within one and the same closely argued proof.

But though Augustine thus identifies soul with self he does not criticize the one conception by the other. He never turns upon the obscure conventional attributes of the soul the searchlight of introspective observation; he never reconciles the divergence between the teaching of Augustine, the observer, "When the human mind knows and loves itself it does not know and love anything unchangeable"[1]—and the dogma which Augustine, the theologian, uncritically takes over from Plato and the Fathers, "The soul is unchanging and simple."

Mediæval philosophers, so far as I know them, neither make important contributions to the conception of soul nor markedly diverge from it. Two instances will suffice for our purposes. Alcuin, as quoted, compresses an assertion of all three of the soul's traditional attributes into a brief sentence: "The soul is a rational spirit ever in motion, ever living, capable of good and evil." St. Thomas also expressly recognizes all three characters of the soul. He describes it as principle of life and of bodily movement—a clearly vitalistic description. He also asserts, in accord with Plato's doctrine, that the soul is simple substance; and he argues elaborately[2] (here, as in his doctrine of the individuality of souls, following Aristotle) that in spite of being the mover of the body, the soul is itself unmoved. Finally, St. Thomas teaches, in the second Article of this same Question 75, that "the soul knows" or rather (he corrects himself) "man knows through the soul." Questions 77 through 80 develop this doctrine of the knowing soul by enumerating and analyzing, somewhat in Aristotelian fashion, the 'powers of the soul,' that is to say, the five senses, the intellect, memory, appetite and will. Like his predecessors, Thomas obviously uses the three time-honored concepts of the soul in unharmonized juxtaposition.

[1] 'De Trinitate,' IX., 6.

[2] 'Summa Theologiæ,' Pars Prima, Question 75, first Article.

IV

The soul makes its way into modern thought encumbered with its three more or less conflicting duties: to be life-giving, to be immaterial, and to be conscious. It is not, however, left undisturbed in the quiet possession of these traditional characters. At the very outset Descartes threatens to deprive it of one of them by destroying its pretension to be the life and mover of the body. For Descartes formulates the mechanistic conception of life and effectively marshals the evidence, from physiological observation and experiment, for this mechanistic theory. Thus, he says that the circulation "follows as necessarily from the very arrangement of the parts of the body and from the heat which may be felt with the fingers and from the nature of the blood . . . as does the motion of a clock from the power, the situation, and shape of its counterweights and wheels." "The body," he repeats in every possible connection, "is nothing more than a machine."[1] Descartes, to be sure, is not daring enough to treat the human body as a perfect mechanism He (1) still conceives the human soul as vitally related to the body though he allows it but a precarious seat in the pineal gland and tries to hold it down to the function of mere direction, not initiation, of the body's motions. In entirely uncritical fashion, (2) in the second place, Descartes adopts the immaterialistic doctrine, asserting after the manner of Plato, Antoninus, Philo, Augustine, and Thomas the simplicity of the immortal soul and its utter unlikeness to the body. But he (3) also stresses the psychological conception of the soul as conscious being; and here, once more in agreement with his predecessors and in particular with Augustine, he uses the term 'soul' as virtual synonym for 'self' or 'I.'[2] Even more often, however, he describes the self, or I, purely as a conscious being, without reference to the traditional characters of the soul. Thus he says, in reply to the question: "What then am I?" "I am a thinking thing . . . that doubts, understands, affirms, denies,

[1] 'Discourse on Method,' V.

[2] 'Meditation,' II., paragraphs 4, 7; *et al.* For Descartes's narrower use of the term 'think' cf. paragraph 5 of '*Meditation*,' II; *et al.*

wills, refuses, that imagines also and perceives."[1] There is here no mention of 'motive power' or simplicity or immateriality: I am conscious self.

This divorce of self from soul, as will presently appear, becomes explicit in the teaching of Locke. (1) Locke follows Henry More[2] in stressing the conception of the soul as "capable of motion," as "changing distance" and as "moving or quieting corporeal motion."[3] He argues simply that "every day's experience clearly furnishes us with" instances of "will or a power of putting body into motion by thought."[4] This is, of course, a mere reassertion of the classic vitalistic doctrine of soul. (2) The immaterialistic soul of the metaphysicians is subjected by Locke to more radical treatment. He resolutely strips it of all the characters of consciousness and then he rightly insists that the "substance of spirits," thus abstractly conceived, "is unknown to us." "If any one," he repeatedly asserts, "will examine himself concerning his idea of 'substance' he will find he has no other idea of it at all but only a supposition of he knows not what support of qualities."[5] "Our idea of substance," he says in another passage, referring definitely to spiritual substance, or soul, "is but a supposed I-know-not-what to support ideas."[6] (3) To the self, or I, Locke now gives over explicitly most or all the concrete characters which soul and self (before his time uncritically identified) once shared between them: consciousness, moral responsibility, and even identity. "The Self,"

[1] Descartes, 'Meditations,' II., paragraph 7.

[2] More breaks sharply with tradition by insisting that the soul, though immaterial, is not therefore unextended. There are two kinds of extension, More teaches: the first, material and impenetrable, the second a penetrable, "subtle and immaterial extension . . . whereof we have an innate ingrafted idea." The soul is, therefore, a thinking, extended substance ('Enchiridion Metaphysicum, Chap. XXVIII., 3 *et al.*) and is "intrinsically endowed with Life and the Faculty of Motion."

[3] 'Essay Concerning Human Understanding,' Book II., Chapter XXIII., paragraphs 20, 19, 15 *et al.*

[4] More, on the contrary, with his conception of spirit as extended and penetrable, finds nothing impossible in the view that a spirit may literally and "easily pass through" and influence "anybody."

[5] 'Essay,' Book II., Chapter XXIII., 2.

[6] *Ibid.*, Chapter XXIII., 15. Locke accords with More in this doctrine. Cf. More's 'The Immortality of the Soul,' Lib. I., Axiom 8: "The subject or naked essence or substance of a thing is utterly inconceivable to any of our faculties."

he declares, is "that conscious, thinking thing (whatever substance made up of, whether spiritual or material it matters not) which is sensible, conscious, capable of happiness or misery, concerned for itself."[1] And by 'person'—a term which he uses as synonym for 'self'—Locke means 'a thinking, intelligent being that . . . can consider itself as the same thinking being in different times and places.'

To speculate on the curious tenacity with which Locke clings to his empty shell of a soul (expressly reduced to an 'I-know-not-what' and replaced by a self to which he attributes persistence, individuality, and consciousness) is irrelevant to our main purpose. Evidently, even Locke's independent spirit could not withstand the force of the traditional doctrine which received from Plato its classic form—the conception of a being endowed with chiefly negative characters, a not-body, uncompounded, unchanging, immortal; and he seems also to have clung to the soul as a resource in the self's frequent lapses of forgetfulness;[2] but modern students, unhampered by the classic convention, have not scrupled to take the step from which Locke instinctively recoiled: they have rejected altogether the merely inferred, 'immaterial,' 'life-giving' soul—but unhappily most of them have failed to take the preliminary precaution of transferring from the soul to the self the actually experienced characters of persistence, individuality, and consciousness.

It is thus evident that our study of the concept of soul has provided us with an answer to the question from which we set out: why do not all psychologists (and philosophers) acknowledge the existence of the self? One answer to this question was suggested in the beginning: psychologists, like other men, are naturally inattentive to the permanent background of all experience; but a second, a historical, explanation of this pertinacious prejudice emerges from our study. From the very start the self has been confused with the soul; that is to say, the soul has been conceived not only as life and as immaterial substance but also as conscious being. Now when modern biologists, following Descartes's lead, hold

[1] 'Essay,' Chapter XXVII., 17.
[2] *Ibid.*, Chapter XXVII., 10.

that organic processes can be mechanically explained—these mechanists in rejecting the concept of soul as life, reject with it the wholly different conception of the conscious being. And when psychologists and philosophers alike discard the partly mythical, partly empty conception of the soul as simple, immaterial substance they too reject also the conscious being. In their justified but undiscriminating attack on vitalism and immaterialism many scientists have thus unwisely rejected the basic fact of psychology: the directly experienced, changing yet persistent, individual, and complex conscious self. And, in similar fashion, the philosophic critics, from Hume down,[1] have been wont to attack not the experienced self but the soul. The remedy is obvious and has already been suggested. The reinstatement, imperatively needed, of the self in psychology requires, first, that the self take over from the soul the experienced characters which comport so oddly with the inferred attributes of soul; and second, that the soul thus despoiled of consciousness, be dismissed from psychology—unless, indeed, the term be retained as mere synonym of conscious self or I.[2] The reasons for this expulsion of the soul from psychology—and indeed from philosophy—need hardly be re-stated. The metaphysical soul or incorporeal, simple, unchanging being is clearly unjustified by experience, an empty abstraction except for the characters—persistence and individuality—which as truly belong to the self. With equal vigor, the vitalist's soul, or guiding entelechy,—opposed by Descartes but warmly upheld in our own day—must be rejected. For some of the facts on which vitalism rests its case, the occurrence, for instance, of life-furthering instincts, may be mechanically conceived; and the rest are not vital phenomena at all but experiences of the conscious self.[3]

[1] Yet Hume distinguishes soul and self. Cf. 'Treatise,' Book I., Part IV., Sections V. and VI.

[2] In this sense, for the most part, Leibniz and Berkeley use the term (cf. the phrase "mind, spirit, soul or myself" in 'Principles of Human Knowledge,' II.) In the doctrines of Wolff, Baumgarten and other rationalists of the eighteenth century the vitalistic and the immaterialistic conceptions of soul recur. Cf. Baumgarten, 'Metaphysica,' III., II, 1, § 750, Wolff, 'Psychologia rationalis,' §§ 48, 49.

[3] It is interesting to find that some of the modern biologists who challenge the extreme claims of mechanism, virtually identify vitalism with idealistic and personal-

There is, in a word, no middle term between the mechanical phenomenon and the self. This study, therefore, culminates in one insistent conclusion: the soul must go. As a historic concept of immense influence it will always retain its prominent place in the history of ideas; as a term of modern psychology it has outlived any use it may once have had and has become a source of mischievous confusion.

istic philosophy. Thus, H. V. Neal writes: "Biologists must . . . accept the idealistic assumption"; and again "the organic individual is in reality spiritual." ('The Basis of Individuality in Organisms; a Defense of Vitalism.' Address before the American Society of Zoologists, *Science*, N. S., XLIV., pp. 82 ff.) Other biologists, of whom J. A. Haldane may serve as type, reject conventional vitalism along with pure mechanism and count themselves with the personalists ('Mechanism and Personality').

RELATION BETWEEN STRUCTURAL AND BEHAVIOR PSYCHOLOGY

BY A. P. WEISS

Ohio State University

The purpose of this paper is to show that the problems in the study of mind which are ordinarily the problems of the structural psychologist, may be studied from the behavioristic point of view, in accordance with the methods employed in the natural sciences and with a greater degree of simplicity than is possible from the structuralistic point of view. No attempt will be made to determine whether behaviorism is or is not psychology. The title of this paper might also have been 'The Value of the Objective as Compared with the Subjective Method in Psychology' were it not for the fact that the terms 'objective' and 'subjective' because of their uncertain connotation, are in evil repute both in psychology and in all the social sciences.

Problem of Structural Psychology

To state the structuralists' problem is not an easy one if justice is to be done to all the psychologists who are representative of this school. There are, however, certain fundamental conceptions which are characteristic of structuralism that are generally accepted, and it is to these that the discussion will be limited.

By the term structural psychology is meant the type of investigation which assumes that there is an existential datum called mind or consciousness, within the totality of which ultimate differences may be discriminated which are given the names of (1) sensations, (2) images, (3) affections. These are usually regarded as the elements into which consciousness may be analyzed. The aim of the structural psychologist who accepts this analysis is to describe consciousness, in all its

complexity, in terms of these three fundamental classes of consciousness. There is, of course, considerable difference of opinion between structuralists as to just how these classes are to be defined, and indeed, whether there are no more and no less than three elementary categories. But for our purpose these details may be disregarded. It is also irrelevant for us whether it is held that consciousness is present in a situation in which sensations, images and affections, as such, are absent. It is sufficient if we recognize clearly that the structuralist aims to describe the structure of the mind or consciousness, under the manifold conditions of present-day life, in terms of whatever elements he may have set up, and that he considers the descriptive phase of his investigation as complete when he has done this. The explanatory phase of the structuralist problem is the determination of the neural correlates of the conscious states which his analysis reveals.

The direct method by which the structuralist analyzes a conscious complex into its elements is that of introspection. This cannot be done satisfactorily under normal conditions. It is therefore customary to create an experimental situation similar to the one to be analyzed, in which the observer is asked to report in language the mental states that were present during the experiment. These reports of the mental states are then treated statistically. The experimenter assumes that the verbal reports of mental states are not the mental states which the observer introspected, but that the reports are merely expressions which describe the character of these mental states.

There is considerable difference of opinion among structuralists themselves as to whether introspection gives equally valid results in all cases where it may be used. Some maintain that even the most complex mental states may be analyzed by the introspective method, while others maintain that introspection modifies complex conscious experiences so that the elements which it reveals may not be present in the actual experience which is being investigated.

Origin and Problem of Behavior Psychology

As the applications of structural psychology became more numerous in the various applied fields of psychology such as education and medicine, the question as to the relation between conscious states and action arose. An increasing number of psychologists believed that sensations, images, memories, thought, emotion, affection, etc., were the causes or invariable antecedents of certain forms of human behavior. This naturally led to the question as to how consciousness was related to changes in the form of human behavior. Now, since no one denied that, in order to modify behavior, a corresponding change in the neural correlates of consciousness must take place, this inquiry necessarily came to be stated as follows: How can consciousness change the direction of a nervous process? In its most general form this question is an inquiry into the relation between mind and body. In animal psychology the mind-body problem is not an acute one for the zoölogist-psychologist who studies animal behavior; and the success which these investigators have had in explaining some of the most complex forms of animal behavior in purely neural terms (tropisms, reflexes, instincts) has led some of the psychologists to ask whether human behavior could not be placed in the same category with animal behavior and explained without the introduction of a mental or conscious factor.

The attempt to answer this question by the application of the behaviorist point of view to such relatively simple forms of human behavior as reflexes and automatic action was crowned with considerable success, but for the more complex behavior of learning the strictly neural explanation is not readily accepted by psychologists. It will not be necessary at this stage to state the behaviorist problem in detail except to indicate that the behaviorist is concerned with determining the properties and laws of the neuro-muscular system, of which the introspective reaction is a part.

Briefly, we may state the problem of the structuralist as an attempt to answer the question: *What are our mental states*

and how do they come about? while the behaviorist problem is: *What are our actions and how do they come about?*

The following paragraphs are devoted to a discussion, from the behaviorist point of view, of those factors of structural psychology which give it its distinctive character: namely, the relation between mind and body or the character of consciousness; and the character of introspection.

Behaviorism and the Mind-body Problem

Discussion by psychologists of the mind-body problem has led to the formulation of the three following positions:

1. Consciousness does not enter as a causal agent into such actions as reflexes and instincts, but it does function in what is usually known as intelligent or voluntary action.

2. Consciousness cannot be regarded as the invariable antecedent to any kind of action whatsoever.

The first position is the one usually taken by popular psychology and the group of psychologists known as "functionalists," while the second position is the one maintained by behaviorists. The position of the structuralists is usually known as the double-aspect view, in which there is,

3. Parallelism between conscious processes and neural processes without a causal relationship between them.

This position is best described by the following quotation:

> "Our own position has been that mind and body . . . are simply two aspects of the same world of experience. They can not influence each other because they are not separate or independent things. For the same reason, however, whenever the two aspects appear, any change which occurs in the one, will be accompanied by a corresponding change in the other."[1]

The third view may be regarded as an intermediate position between 1 and 2. That is to say a functional relationship does exist between mind and body but only in the mathematical sense of the term function, as when we speak of the volume of a sphere as a function of its radius.

If this functional relationship between consciousness and behavior is a simple one it would be useful for the behaviorist, because consciousness could then be used as a measure of

[1] Titchener, E. B., 'A Text-Book of Psychology,' 1912, p. 9.

behavior, no matter what the ultimate connection between mind and body might be.

Setting aside all speculation about this connection we find that the facts in the case may be stated in the following propositions:

1. Consciousness (the totality of our sensations, images and affections) is a purely personal experience and has no scientific value or validity unless it is *expressed* in some form of behavior, such as speech or other form of representation.

2. Many forms of behavior (reflexes, automatic action) are not accompanied by consciousness which can be unambiguously analyzed.

3. The consciousness which does accompany a given form of behavior varies from one observer to another, and at different times for the same observer.

4. Complex mental processes, such as reasoning and invention, are more than the mental states into which they may be analyzed. They have a social reference which no amount of introspection will reveal. This social reference is measured by the comparison of the individual's behavior, either with his ordinary behavior or with that of other individuals.

From the above propositions the behaviorist feels justified in making certain deductions:

From proposition 1: If consciousness must be expressed in some form of behavior before it becomes a scientific datum, then consciousness is in the last analysis a classification and a study of behavior.

From proposition 2: If there are many forms of behavior (reflexes, automatic action) which are important from a social or individual standpoint, which are not accompanied by consciousness, then consciousness is not a function (mathematical) of *all* forms of behavior.

From proposition 3: If the consciousness which does accompany a given form of behavior, varies from one person to another, or for the same person at different times, then consciousness is either an independent variable of the behavior, or a dependent variable of highly complex formula. In neither case is it any better measure of behavior than the

behavior itself, and consciousness then becomes superfluous as a means for predicting behavior.

From proposition 4: If complex mental processes such as reasoning or invention are more than the mental states into which they may be analyzed, then in this case too the analysis of consciousness does not make it possible to predict the individual's behavior.

In view of the above implications, the very simplest assumptions as to the quantitative relations between sensations, images and affections which characterize an individual's conscious complexes, it is impossible to predict what his mental states will be after an hour. An individual's behavior, however, can be predicted with much greater certainty than can the character of the conscious processes which go with it. A daily photographic record, for example, will show greater uniformities in the behavior of a given individual so far as the socially significant factors are concerned, than will the daily introspective descriptions of the consciousness which accompanies his behavior.

It would seem then that the sensations, images and affections which one experiences are more variable than is behavior, since by the term behavior we usually refer to only the grosser bodily movements and to the speech reactions. The finer changes in muscle contractions, as in respiration, digestion, vascular and glandular changes, are ordinarily not considered as socially significant.

For the behaviorist, then, the double-aspect view of the structuralist is of no value, since the function (consciousness) of the behavior is more variable than the behavior itself.

Consciousness an Inference Derived from the Introspective Reaction

The structuralist is usually disposed to consider the investigations of the behaviorist as quite outside of his field, because consciousness or mind is something entirely distinct from the contraction of a system of muscles. In the last analysis, however, the consciousness of his observer which the structuralist regards as the unique phase of his investi-

gation, is only an inference from the verbo-motor behavior which is called introspection. Structuralists' experiments are controlled reactions to stimuli just as in any behavior experiment. The sensations, images and feeling that are described, are not experienced by the structuralist. They are inferred from the behavior of his observers.

When for instance, an introspective reaction reads, "My attention fell upon the central projection, and vocal-motor imagery of 'Gosh, that's ugly' occurred. I was aware of contraction of my brows and unpleasantness." The structuralist infers that these speech reactions are descriptions of the consciousness that he has when he makes the same speech reactions. To every introspective report of his observer, the structuralist adds, at least implicitly, the speech reaction, namely: "The introspective report of my observer completely describes certain conscious processes of which I am myself conscious or aware, when I make the same speech reactions."

In other words, psychologists have agreed among themselves that an introspective report is more than a reaction; it is a verbal reaction plus some kind of a conscious process, which may be either sensorial, imaginal or affective. The behaviorist may well ask of what scientific value is this habit of supplementing, in a methodological sense, the observer's reaction by another reaction of an entirely different type (consciousness) which the observer did not report. By inferring a conscious correlate to the introspective report—the experimenter is not able to derive anything more from the report than is expressed in it. The manual and introspective reactions of the observer in a psychological experiment can be classified just as minutely and scientifically without inferring a conscious correlate, as they can with it.

Behaviorism and Introspection

From the behavioristic standpoint, introspection may be regarded as an example of habit formation or learning. An untrained observer cannot make these introspective speech reactions in a manner which is constant and uniform enough to permit of statistically treating the results. In order that

these supplementary speech reactions may become uniform enough to admit of statistical analysis, two methods of simplifying the results are usually employed:

1. The observer passes through a preliminary period of training in which the reaction time of relevant speech reactions (report of imagery, kinesthesia, etc.) is reduced to the experimental requirements, and those speech reactions which are irrelevant are given an opportunity to disappear. The relevancy of a given speech reaction is usually determined beforehand according to the specific aim of the experiment.

2. The experimental situation is so modified by supplementary situations in the form of instructions, questions or other controls that the required uniformity of the introspective reactions is secured.

The first method is the one with which we will especially concern ourselves in the following discussion.

As already indicated, the total reaction of an organism to even the simplest situation is very complex. Respiration, secretion, circulatory effects, incipient and minute bodily and visceral movements, are always added to the particular reaction (the discrimination of two points, for instance) which might be called the major reaction of the experiment. The minor reactions by themselves would escape notice, but the speech mechanism is a rather sensitive index as to the character of these minor reactions. Permitting a free verbal report after each trial or series of trials in an experiment, reveals more as to the character of the *total* reaction than can be learned from the major reaction alone.

Organic and kinesthetic reactions which would escape observation entirely are thus easily revealed by the speech reaction. If, for instance, an observer who has been trained according to method (1) reports a 'kinesthetic sensation of movement of the neck' that report from the behaviorist point of view would mean, 'an incipient or slight movement of the head,' provided his methods of measuring such movements were accurate enough. In this way the verbal reaction 'kinesthetic sensation of neck movement' really indicates that the receptors in this case are located in the neck muscles.

The speech reaction may therefore be regarded as a function of particular kinesthetic and organic reactions which ordinarily would escape observation.

To report kinesthetic and organic conditions through speech is really a highly specialized example of habit formation. Indeed introspection, whatever its kind, from this point of view may be regarded as a continual process of training in the formation of habits. For this reason many years of training are necessary even for those who have special aptitude in this direction, and many persons never learn to introspect well.

The training of an individual in introspection is, therefore, a process of:

1. Training in *discrimination* so that weak stimuli in obscure receptors lead to verbal reactions.

2. *Substituting* for the usual anatomical and physiological descriptions (head, neck, arms, muscles, viscera, etc.) the special terminology of the structuralist (sensations, images and affections).

The relation of these obscure receptors to the major reaction of the experiment may be of a highly adventitious character. A trained observer does not react exclusively to the experimental situation—one is almost tempted to say that he reacts to everything but the experimental situation. An experiment with trained observers measures principally the training of the observers, it does not necessarily reveal what the normal individual could be expected to do under similar situations or conditions.

From the behavioristic standpoint, then, introspection may be regarded as a greatly augmented reaction to a given situation. The observer not only reacts to the situation, for example, by pressing a key, but he is also asked to react by speech to the stimulation of many secondary and obscure receptors, to which, under normal conditions, no such reaction is made.

Heuristic Value of Introspection

When the structuralist experiment is stripped of its conscious reference and regarded from the standpoint of objective science, its twofold character immediately comes to light as may be seen from the following quotation which is part of the conclusion of a long and painstaking series of experiments "On the Analysis of a Phase of the Process of Classifying."

"The essence of the process of classifying, as this process occurred in our experiments, consisted in the manner of our observer's perceiving the object which he had been instructed to classify. This manner of perceiving consisted in the fact that the region of essential group features—were stressed in consciousness, and these regions behaved in consciousness in a fashion which depended upon their resemblance or lack of resemblance to the corresponding features in the group members. In the former event, the regions in question passed in and out of consciousness in rapid and ready fashion, without retarding the course of attention. In the latter case, on the other hand, the course of attention was arrested sharply; these regions often persisted in consciousness, and they were frequently accompanied sooner or later by more or less focal and intensive kinesthetic, organic and affective contents which functioned in their conscious settings as definite rejectings of the figure."[1]

Will the above conclusions, we may ask, enable a botanist or zoologist to classify his specimens more effectively, or will the scientist know any more about classifying than he did before he read the article? The question may even be asked, whether this particular experiment is really an investigation of the process of classifying. From the behavior point of view at least, the investigation would be regarded as an experiment in discrimination and habit formation, carried out under the following conditions:

An experimental situation was created which approached the conditions under which people make classifications, except that the classifications are rather more than ordinarily difficult. A number of observers who had been carefully trained to respond verbally to the weak stimulation of obscure receptors, were asked to perform a double task; to classify the cards, and also to react to the obscure receptors by verbal

[1] Fisher, Sara C., 'An Analysis of a Phase of the Process of Classifying,' Am. J. of Psychol., 1917, 28, p. 115.

I have chosen this particular illustration because I regard it as one of the best structuralist experiments that has appeared for some time and I need hardly say that no criticism is intended either of it or the method by which the investigator carried it to completion.

reactions which conformed to a more or less uniform terminology. An analysis of the author's conclusion quoted above, in behaviorist terms, may be stated in the following propositions:

1. The observers were able to classify the cards.

2. The observers reacted either to the similar or to the dissimilar features of the cards. The reactions to the similar features were relatively simple; the reactions to the dissimilar features were supplemented by verbal reactions to obscure kinesthetic and organic receptors.

The whole emphasis of the experiment is placed upon what the behaviorist would call the reactions to obscure receptors. The actual process of classifying the cards was merely a device to obtain some degree of uniformity in the verbal reactions to these obscure receptors. From these considerations we can see why the experiment has so little significance for the scientist who really wishes to increase his classifying efficiency. The development of the ability to react to the weak stimulation of obscure receptors may be of value in the above experiment as a means of determining when the investigation of the classifying process was being supplanted by the minor reactions which have no direct bearing on the process of classifying.

That is to say, the presence of sensations, images and affections, indicate that there is something wrong with the experiment.

In ordinary scientific observation, the aim is to eliminate the unessential or obscure so that the effect of the major condition can be observed in isolation. Under behavioristic methods, however, if it is desired to investigate the minor reactions independently, then every effort is made to isolate them and they of course then become the major reactions. But the introspective reactions in this particular experiment would be regarded by the behaviorist as a disturbing factor.

In our effective adjustments to our environment, we do not have sensations, images or affections. When we stop to introspect as to the character of our consciousness in a given situation, our reactions to that situation become to this

extent irrelevant. The writer has frequent occasions to design modifications in apparatus used by the students working on original problems. Having also some epistemological interest, it often happens that he begins to introspect on the method by which the designing process is going on. When this happens, he might as well stop. Introspection seriously interferes with the designing activity. The reactions, incipient though they be, which are called introspections, change the character of the designing activity to such an extent that it can no longer be called the designing activity. This is gone; he is merely reacting to a new situation by making aimless sketches and many incipient verbomotor processes which if recorded might read, "Bronze contact, visual image of tuning fork, kinesthetic sensations of neck muscles, slight unpleasantness, image of Mr. M. before chronoscope, visual image of Prof. X. rushing upstairs, etc."

None of these reactions would have occurred had he actually completed the original design. This is, of course, not a unique situation. Under the ordinary conditions, sensations, images and affections are absent. The average man probably never has them; he must be trained to have them in the same way that we must be trained to read and write. Introspection is only one of the ways by which we may react to a situation. How the reactions themselves originate, or what the conditions are under which they become modified, is not revealed by introspection.

Tautological Character of Introspection

By selecting a somewhat simpler activity than that of "classifying" it can be shown that the introspective records are merely special terms for particular classes of reactions. Suppose we take the process of recognition from the structuralist standpoint. We may assume that the recognitive consciousness is made up of a characteristic pattern of sensations, images and affections. Suppose the experiment is one in which we are to select a card (A) which has been previously examined, from a series of similar cards which have not been previously examined. We wish to know whether

the card (*A*) has been recognized. To do this, the behaviorist would inspect the introspective reactions of the observer. Suppose the verbal reactions to the card (*A*) to be the following. "I have seen it before; I have a visual image of it as it appeared when I saw it for the first time; I have the feeling of familiarity; I have organic and kinesthetic sensations (images?), which mean that I am handling it in a more energetic and discriminative fashion than the other cards; etc." To the new cards the verbal reactions might be as follows: "I have never seen these cards before; the kinesthetic and organic sensations are different than for card (*A*); they do not carry the meaning of familiarity; the visual and auditory imagery is different than for card (*A*); etc." It is not supposed that this is the complete introspective record, and we disregard for the present such objective measures as the reaction time, or of the bodily movements which might have been made.

If we regard the introspections from the purely objective side as being muscle contractions of the speech mechanism which produce the various sounds which we call words or speech, we can immediately see that the observer has reacted differently to the card (*A*) than to the other cards. It is not necessary to interpolate a conscious process (of recognition) in order to see this. The fact is, that if the observer has used the identical words to describe both the (*A*) and the new cards, we should be obliged to conclude that there was no difference in the observer's consciousness of the (*A*) and the other cards. That is to say, a difference in consciousness can only be inferred from a difference in behavior. Moreover, the interpolation of consciousness does not explain how it came about that the card (*A*) was reacted to in a manner different from that of the other cards. The introspective record merely reiterates the fact that the observer *did* react differently. This could have been seen directly by regarding the report of the introspective reactions as what, in fact, they are—objective reactions of the speech type. Because the observer reacted differently to the (*A*) than to the other cards, the experimenter says he has given a recognizing

reaction. We cannot say he reacted differently because he recognized, but that he recognized because he reacted differently. In this sense the inference of the conscious process of recognition is tautological.

Structuralism a Phase of Behaviorism

The structuralist point of view can, of course, be consistently maintained. There is a justification for inferring the existence of a conscious correlate for at least some of our actions, but the heuristic value of this assumption seems doubtful when it is shown that behaviorism is not less discriminative or descriptive than structural psychology, and in addition it has the promise at least of a system whose parts are causally related to each other in the sense that a temporal description of a given form of behavior is more uniform than the temporal description of the conscious states which are said to go with it. If this is true then the law of Parsimony will operate to eliminate the unnecessary assumption of a conscious correlate for behavior (implied by introspection). When we recall how we are being exhorted to recognize the unconscious, subconscious, higher thought processes, unanschaulichen Bewusstseinsinhalt, one wonders whether this process of elimination has not gone further than we suspect.

For the behaviorist the structuralist's classifications do not lead to a solution of the problem, What are our actions and how do they come about? or How do the manifold social adjustments of the adult grow out of the relatively simple reactions of the child? Even if the objective side of the structuralist problem be further developed, the neural correlate of conscious processes will only be a very special problem in behavior. Sensations, images, affections, emotions, will, the self, recognition, etc., so far as science is concerned are only special instances of receptor-effector activity. While this is of course very generally recognized by psychologists, the further assumption that these forms of receptor-effector activity are highly significant for our understanding how man is able to make his effective adjustment to his environment, is not warranted, because the analysis and isolation of such a

neural correlate does not indicate how the neural correlate itself came to have the configuration that it has.

This, of course, can only be done by a genetic study of the particular type of reaction. For example, when the structuralist has determined the neural correlate for the process called "recognition," his explanation is complete. For the behaviorist this is merely a type of reaction whose effector-receptor phase is described by the proposition: To objects to which we have reacted once, we do not react in identically the same way the next time they are presented, even though the stimulus conditions approach identity for both occasions. This is merely a statement of fact which becomes valuable only when stated quantitatively.

The more important scientific question: *How does this action come about*, can only be answered by increasing our knowledge of neural *function*.

It is in the above sense that we may regard the introspective reaction of the structuralist as only a part of the total problem of determining how man makes his manifold adjustments to his environment.

Basis of Behaviorism

In order to state the position of the behaviorist more concretely, the following assumptions as to the explanation of human behavior are presented.

1. The resistance of neurons varies with function.

2. Every receptor is directly connected by a neural chain with a restricted effector system, and through varying degrees of indirectness to many other effector systems.

3. One nervous process will modify the character of other nervous processes that occur together with it.

4. Certain configurations of neural connections between receptors and effectors are inherited, some are acquired.

These assumptions are not essentially different than those formulated by Max F. Meyer.[1]

From these four laws or assumptions it is evident that there is a possibility of greater variations in the response of an

[1] 'The Fundamental Laws of Human Behavior,' 1911.

organism than is usually included under what the structuralists call the study of mind.

Each of the four propositions represents a series of problems which may be experimentally handled in the same manner that an experiment in any other science would be conducted. There need be no quarreling about consciousness or as to whether there is or is not such a thing, since it will make no difference in the effectiveness of the work of the behaviorist or any scientist how the question may finally be settled. In their present form the propositions represent little more than a program for future work. Each proposition will be divided and subdivided and coefficients will be supplied to the various derived propositions. How fruitful the analysis will be cannot of course be predicted, but if structural psychology, with all the painstaking and careful work that has been done on sensorial and imaginal processes, has not yet developed a definition of sensation upon which two psychologists will agree, then behaviorism can expect a considerable degree of tolerant good will.

Summary

1. The close academic relationship between structural psychology and behaviorism is due to the popular belief that mind and body are related in such a way that mind produces or modifies behavior.

2. A conscious state which is not expressed in some form of behavior is, so far as science is concerned, non-existent. The inference of consciousness is, therefore, unnecessary, since in the last analysis behavior is the only thing that can be classified.

3. For the behaviorist the introspective reaction is only the habit of being able to react by speech, more or less adventitiously, to the weak stimulation of obscure receptors.

4. Even if it is admitted that the special introspective habits are correlated with conscious processes, the latter are so variable that they cannot be used as an index from which to predict behavior which is socially or scientifically significant.

5. The method of introspection favors the reactions to obscure stimuli and in a corresponding degree decreases the

reliability of the major reaction for the investigation of which the experiment is designed.

6. Behaviorism presents as manifold possibilities of analysis and classification as does structuralism, and has the added advantage that its phenomena can be represented as a causal series in the same sense as we now speak of causal relationship in the natural sciences.

7. When the behaviorist solves the problem: How do our actions come about? all the problems of the structuralist will also be solved.

8. The relation between structuralism and behaviorism is such that they may exist side by side. This will occur only when the fundamental conceptions underlying both methods are not very closely scrutinized or where the individual is not particularly interested in the theoretical implications of either the one or the other method.

DISCUSSION

MEANING AND IMAGERY

In the discussion of imageless thought one must bear in mind the fact that there is more than one way in which it might be held that thought is imageless.

1. One might for instance say that thought is not only not identical with imagery, but that it is always and under all circumstances independent thereof, that imagery is in all subjects and at all times subsequent to thought and never helps in the solution of problems that can be thought about. This would be an "out and out imageless position," but one which, so far as I know, no one has yet taken, though some approach it. It would also contradict various pieces of experimental work.[1]

2. One might hold that thought is imageless in the sense that it is a mental process *sui generis*, distinct from imagery, but never imageless in the sense that it is ever present in the mind unaccompanied by imagery. One taking this stand might even maintain that the thought process is dependent on previous mental imagery—in the sense that the image is the source from which the thought process is derived.

Such seems actually to have been the theory of Aristotle who, while distinguishing between and even contrasting *ἐπιστήμη* and *αἴσθησις*, maintained that the mind never thinks without *φαντάσματα*. In fact whenever the mind sees, it is necessary for it to behold imagery—*ὅταν τε θεωρῇ ἀνάγκη ἅμα φάντασμά τι θεωρεῖν*. The next sentence shows that he is really speaking of imagery rather than the forms of sense perception: *τὰ γὰρ φαντάσματα ὥσπερ αἰσθήματα ἐστι πλὴν ἄνευ ὕλης*.

So also St. Thomas maintains that the human intellect cannot actually understand anything without recourse to images. It is interesting to note that this position was taken on the following empirical grounds:

(*a*) When cerebral lesions are sufficiently serious to affect mem-

[1] Cf., for example, George Herbert Betts, 'The Distribution and Functions of Mental Imagery,' Teachers College, Columbia University, New York, 1909.

[2] *περὶ ψυχῆς*, III., viii, § 3.

ory and imagination they also interfere with the orderly course of thought.

(*b*) An appeal to introspection—"quia hoc quilibet in seipso experiri potest"—viz., "when one attempts to understand something he forms to himself certain images by way of example." Likewise when we want to explain a matter to someone else we give examples from which he can derive images that will lead to understanding.[1]

3. Without adopting either of these positions, one might say that while the image is frequently very useful, nevertheless, a thought process can be present to the mind without simultaneous imagery and that it is not necessary for us to draw all our meanings and thoughts from the contemplation of imagery. Thus thought would be imageless in the sense that it is distinct from the *φαντάσματα*. It would often be imageless, too, in the sense that it would not be dependent on the *φαντάσματα* or preceded or accompanied by them.

That the extent to which one makes use of images, and the rapidity with which they come, should be subject to individual variations is certainly to be expected.

In an article on the 'Temporal Relations of Meaning and Imagery,'[2] I pointed out that with eight out of nine subjects I found that meaning preceded visual and kinæsthetic imagery in the perception of printed words, but that in memory, on the contrary, imagery precedes meaning. I was thus led to adopt the last of the three positions I have above outlined.

I did not maintain that this relationship of meaning and imagery in perception was universal. I was nevertheless inclined and still am inclined to believe, mainly on empirical grounds, that it will be very rare that individuals will be found who present genuine exceptions. The one subject who proved an exception in my experiments, did not learn to refrain from reacting to nonsense words, so that one could not be sure of just what he was reacting to, when supposed to be responding to the task meaning or imagery.

I remember talking the matter over with Bühler, who thought that exceptions would prove more frequent than I supposed. Since then, I have often wondered what experiments on a larger number of subjects would reveal.

In the March issue of the PSYCHOLOGICAL REVIEW, Edward C.

[1] Cf. 'Summa Theologica,' I., Q. lxxxiv, § 7.

[2] PSYCHOL. REVIEW, May, 1915.

Tolman has undertaken such an investigation on 49 subjects. He attempts a preliminary sorting out by having his subjects react to words representing black or white objects: (*a*) when they knew whether it was black or white irrespective of the way in which this was known; (*b*) when they could see it from their visual image. All but fourteen of the subjects gave shorter times for knowing than for visualization. I regret that this modification was made use of, because it changes the whole situation. It introduces a new problem and one in which visual imagery might be very useful and would, therefore, be more likely to be used than in the former situation. I am inclined to believe that I would be ranged among the visualizers in attempting its solution.

Unfortunately this preliminary sorting cannot be compared to the word perception test and we thus still lack evidence of the relative frequency of the cases in which imagery precedes meaning in the process of perceiving printed words.

Having selected fourteen subjects by this preliminary experiment as likely to prove an exception to the usual order he subjected them to the same type of experiment that I used in Munich. He finds, nevertheless, that three of these gave the same order of sequence that I found in Munich. Three subjects gave doubtful results. Eight gave results distinctly(?) pointing to the opposite sequence, so that with them reaction time to meaning was longer than to imagery. In the last group he finds two subdivisions. The first comprises those who as a rule tend to distinguish between meaning and imagery.

Let us consider this group a moment and see why their reaction times to meaning are longer than to imagery. In every one of the introspections given (pp. 133–134) the meaning is analyzed and more or less roughly defined and does not correspond to the 'simple meaning' spoken of in my paper. Sometimes the meaning is evidently a 'concept of purpose' for which I also found much longer reactions. I have not time here to discuss 'analyzed' and 'unanalyzed' meanings, but hope to do so soon in a monograph on 'Perception and Memory' now almost ready for publication.

Meaning is a process which undergoes development. It is not surprising that some subjects wait until it has developed and they feel sure of a definite analyzed meaning before reacting. In these subjects one is likely to get reaction times that are longer than those for visual imagery. This expectation seems to be realized in the reaction times of this set of Dr. Tolman's subjects and confirmed by their introspections.

The second subgroup of subjects did not distinguish between meaning and imagery and their introspections show that when reacting to what they called 'meaning' they were as a matter of fact reacting to images. In only one member of this group is the difference between the averages greater than the mean variations. In none of the others is it even half as great. It might be safer, therefore, to place all but one of these subjects in the doubtful group. Whether the task is meaning or imagery they react to one and the same thing and naturally give in either case about the same results. The general slight tendency to a longer reaction time with meaning and the single pronounced tendency in that way with one subject might readily be accounted for by their being called upon to pick out what they have not been accustomed to label.

Dr. Tolman's assumption that with them meaning *is* imagery supposes too great a distinction of types. It is possible, but scarcely probable, that one set of normal men understand and visualize, whereas the other visualize but never understand. I do not doubt that other experiments would show that these subjects were not wholly devoid of understanding as something distinct from imagining.

Dr. Tolman's study does little more than raise the question: Are there really any genuine exceptions to the hitherto observed relation in the sequence of meaning and imagery? But what would be the import of finding exceptions—and, let us say, even numerous exceptions to the rule? I do not see that the demonstration of even a large number of exceptions would weaken the argument, drawn from temporal sequence, to establish a distinction between meaning and imagery.

Let us suppose that two events moved usually with the same velocity, so that we could scarcely ever detect one without the other. If, however, under certain circumstances one moved more slowly or more rapidly than the other, so that we could observe one without the other these cases alone would enable us to say that the two things are not really identical.

If meaning is identical with imagery then the two events must *always* come together. If it is not then you will find some subjects in whom their rate of development is not identical and one will come before or after the other.

If meaning is dependent on imagery, *e. g.*, in the Aristotelian sense, then imagery will always precede meaning.

We find on the contrary that meaning as a rule precedes imagery.

It is, therefore, not identical with it and as a rule does not depend upon it in the process of the perception of printed words representing objects easily visualized.

Dr. Tolman's paper confirms this very important fact. At the same time it presents no absolutely conclusive proof of subjects who constitute an exception to the rule. It is quite possible, however, that some subjects will be found capable of distinguishing between meaning and imagery, in whom the development of images is so rapid that their mental pictures will usually precede their simple unanalyzed meanings. Such a fact would be significant in the study of types of individuals, but would have little bearing on the more theoretical problem of the existence of imageless thought.

THOMAS VERNER MOORE

CATHOLIC UNIVERSITY OF AMERICA

SOME EXPERIMENTS IN MOTOR REPRODUCTION OF VISUALLY PERCEIVED FORMS.

Some little time ago I had occasion to observe experimentally certain cursive figures of an unusual type while engaged in an experiment along lines quite different from that of the experiment here reported. These figures were presented by means of the Whipple tachistoscope. They were to be learned by means of frequent repetitions, so that they could be reproduced with pencil on paper. The experiment had to do with the relative advantages of learning figures by means of copies in strong relief traced by the fingers of blindfolded subjects, and by means of copies of similar figures exposed to visual perception by the tachistoscope. I acted as a subject for both forms of learning, and had opportunities to observe closely other subjects at work.

Early in the course of this experiment I became interested in the fact that the behavior of the subject at the time of attempting to reproduce the figure was an important factor in determining the accuracy of the reproduction. I found it to be true of myself, and it seemed to be true of other subjects, that if one watched what he was doing while attempting to make the reproduction it seldom happened that the result was as satisfactory as if the reproducing was done with eyes shut or averted. After casual inspection I found that practically all the subjects concerned were far more satisfied that their reproductions resembled the model closely when these reproductions were made without the subjects seeing what

they were doing. The point seemed to me to be of sufficient interest to warrant some investigation.

One may have a pretty definite idea of just what he wishes to draw, and may take his pencil in hand with absolute certainty that he will draw it quickly and easily. But as he draws it his eyes follow the outline being reproduced. Does the sight of what he is drawing aid him in completing the figure accurately? Or do the visual perceptions interfere with and destroy the guiding memory images? It is to be understood that the figure which serves as model is not in sight during the reproducing process.

The problem finally assumed the following form: "If one is reproducing on paper an outline which he has just memorized what effect does the visual perception given by the figure in process of being reproduced exert on the visual or kinæsthetic images which are directing the process?"

A series of figures was made which could be presented on the tachistoscope. It was not particularly easy to find figures which were sufficiently new to really require memorization. It would not do to have the figures so made that one could easily describe them to himself in terms of association with other forms or objects. We had recourse to the Arabic alphabet, and, by adaptation and combination, constructed therefrom several figures suitable for our use. There were ten of these figures finally selected, and they were arranged in two groups of five each. In each group these figures were arranged in order of difficulty; or rather, we attempted so to arrange them. We did not discover any principles which would give an adequate *measure* of difficulty, and were forced to be content with arranging them according to the general complexity of the figures, their number of curves, loops and line crossings. We were careful to vary the order of presentation of the figures so that if any were markedly harder than others that fact would not influence the results in one direction more than another.

There were two methods of reproducing the figures after they were learned. In the first method, hereafter called the "sight" method, the subject would watch what he was doing while drawing the figure. In the second or "blind" method a screen was interposed between the eyes of the subject and the paper so that he would not see what he was doing while trying to draw the remembered figure.

The following directions were given to subjects before reacting according to the sight method:

Fixate cross. Observe the figure which appears, and after the smallest possible number of exposures draw it on the paper in front of you. Try to get both direction of turns and general proportions of figure correct.

Subjects about to react according to the blind method were instructed as follows:

Fixate cross. Observe the figure which appears, and after the smallest possible number of exposures draw it on the paper in front of you, but keep eyes on the screen between you and the paper while you are drawing it. Try to get both direction of turns, and general proportions of figure correct.

One half of the subjects followed first the sight method on one set of figures, and then the blind method on the other set of figures. The other half of the subjects used the blind method first and then the sight method. In half the cases the figures used for the sight process were those of Set I., and in the other cases the figures were those of Set II. So that it is true that the same figures were sometimes used for reproduction with sight and sometimes without sight. Also, the same set was at times presented first, and sometimes second. It does not seem that the results could have been influenced by any possible differences in difficulty between individual figures, nor that any possible practice effect was exerted on one reproducing process more than another.

The exposure time averaged 65/100[1] of a second in length. The subject was told that he could have as many exposures as he wished, but was urged to request as few as possible. It was made very plain that he must make every effort to keep the number of exposures few in number.

There were twenty subjects. All but one were students in Oberlin College, the exception being an instructor in economics. All but three were taking courses in the psychological laboratory. The exceptions were the instructor just mentioned, and two students who had had a good deal of training in art. The fact that they had done practical work in drawing suggested that their inclusion in the list of subjects might furnish some interesting variations in results. In point of fact their reactions were in no respect different from those of the other subjects.

[1] The working time of the Whipple tachistoscope varies quite a good deal, but this was the average time. In the tachistoscope in the Oberlin laboratory we have replaced the usual cardboard discs with light metal (ordinary sheet tin) discs, and we time the length of exposure by means of two make-and-break contacts, so arranged that when the disc revolves a circuit is broken at the point at which the exposure begins. This circuit is remade when the disc reaches the place at which the exposure is completed. A magnetic marker is arranged in series with these contacts. This method may leave something to be desired from the physical standpoint, but, after all, it furnishes one with some real information concerning the exposure time.

Eleven subjects used the sight method of reproduction for the figures of Set I., and the blind method for Set II. Nine subjects used Set II. for the sight method, and Set I. for the blind method. It was merely accidental that there were not ten subjects in each group.

When the time came to sum up the result of the trials, it was necessary to find some method of determining the relative accuracy of the figures as reproduced. No completely satisfactory method of measuring occurred to me and I finally arranged arbitrary principles of scoring, and applied them to all the figures alike. The rules which governed the scoring were as follows:

1. Score 1 for each exposure required for learning.
2. Score 1 for a curve in the wrong direction.
3. Score 1 for very great error in the proportion of parts.
4. Score 1 for the insertion of any marked alteration.
5. Score 1 for omission of an essential part of figure.

(Do not score 2 if an essential omission has been part of the result of a curve in the wrong direction.)

It can be seen that on this scheme the lowest score is the best, that there can be no score lower than one, and that there is no maximum score. It should also be noted that the number of exposures required plays an important part in the final score.

The total score made by the twenty subjects when seeing what they were drawing was 381. This gives an average of 19.05 for each person, or of 38.1 for each figure.

The total score made by the twenty subjects when drawing without seeing what they were drawing was 326, an average of 16.3 for each person, and 32.6 for each figure.

It may be objected that the number of exposures should not have counted in the summing up of the results. Some of the subjects may have asked for more exposures than they needed, or might have made equally good reproductions with fewer exposures than they actually requested. I feel that the number of exposures must have had some effect upon the accuracy of reproduction, though I am not quite satisfied with the particular method used for exposing the figures, that is, by means of the tachistoscope. But if we sum up the results and neglect the number of repetitions entirely, the relations of the figures for sight and blind methods is not thereby changed, although the values of the figures alter somewhat.

The total score for the sight method, not taking the number of exposures into account, is 130, and the total for the blind method, under the same conditions, is 120. The average in the first case is

6.5, and in the second case 6. The difference between the two methods is not so great as when the number of exposures is included in the score, but in both cases the score for reproducing the figures without sight is lower, that is, is better than when sight is used. That is to say, *the scoring methods used show, beyond doubt, a somewhat marked difference between the accuracy of reproductions made with vision and those made without vision, in favor of the latter.*

Furthermore, the opinions of the subjects, recorded at the time of the experiment, largely agree that, on the whole, it is easier to record the remembered figures without vision than with vision. This agreement was recorded in spite of the fact that many of the subjects were sure that the records made without vision were far less accurate than those made with vision, although the final results did not bear out this conclusion at all.

Thirteen subjects agree that the method of reproducing without sight is easier than with sight, and a small minority of them feel that it is the more accurate method. Sometimes subjects would try to explain the greater ease of one method, usually the blind method, by saying that one set of figures was easier than another. But it is interesting to note that in just one half of the cases where this statement was made one set was found to be harder, and in the other half of the cases it was the other set which was found to be more difficult. Evidently it was not the figures which were difficult, but the method of reproduction.

Seven subjects found that reproducing the figure with vision was easier than without. Several of these subjects referred particularly to a difficulty of getting the proportions of the figure correct when they could not see what they were drawing. It is probably true that it is easier to get proportions correct by the sight method than by the blind method.

But of the seven subjects who felt that the easier method was the sight method, two essentially modified their statements, if they did not actually contradict them, as follows: One said, "The sight method is easier than the blind method, because it is easier to visualize when you can see where the hand is going." But during the course of the experiment he had been heard to say in slight exasperation, while working according to the blind method, "Pshaw, I looked underneath it (*i. e.*, the screen) and lost it."

Another subject summarizes the situation by saying: "It is easier to see what one is doing, one gets an idea of where one has gone. But in the blind method I did it quicker, and drawing with sight the

distraction caused the image to be lost." It is significant that "distraction" should be the word used to describe the effect of seeing the figure he is reproducing while the reproducing is in progress.

In its results the experiment seemed to indicate that in reproducing such cursive forms as I used, to see what one is doing is a hindrance, rather than a help. This conclusion is established in several ways. Scoring the results in terms of their accuracy shows an undoubted greater accuracy in the cases of the reproductions made without sight. This would be true with any fair scoring method, I think, but it becomes extremely evident if the number of exposures of the figures used as models be taken into account as well as the accuracy of reproduction. Further, the large majority of the subjects, after working with both methods, definitely prefer the method without sight.

The observations here reported are part of a more extensive study being made in the Oberlin laboratory of the comparative ease and accuracy of learning cursive forms by visual and by kinæsthetic perception. This experiment, still in progress, seems to show that ease and accuracy of learning stand in nearly direct ratio to the amount of movement which is involved in the learning process. This may mean that kinæsthetic imagery has peculiar advantages as regards retention over visual or other imagery, at least for many people.

If this should prove true, it is further true in all probability that the distracting effect of observing the result of one's effort while trying to reproduce a figure recently seen is due to the substitution of visual for kinæsthetic guidance.

GEORGE R. WELLS

OBERLIN COLLEGE